Collection of Critical Situations during Flood Emergency Response

(Main Content:
Local Government Response)

June 2020

International Center for Water Hazard and Risk Management
(ICHARM) under the auspices of UNESCO,
Public Works Research Institute (PWRI), Japan

Introduction

In Japan, floods and landslides have been increasingly frequent in recent years. Of all the municipalities around the country, 97% suffered damage from floods and landslides at least once during the decade from 2009 to 2018. In particular, those in mountainous areas have been seriously affected by such events repeatedly.

In these circumstances, deliberate efforts have been made at the national level in Japan. For example, in July 2019, the disaster management section of the Cabinet Office published a guide for municipalities instructing what actions they should take at the onset of flooding. Even before that, in December 2015, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) produced a disaster management policy calling for cooperation in rebuilding a risk-conscious society with increased preparedness for water-related disasters. Based on the policy, municipalities sharing the same river basin have jointly organized a council for mitigating the damage of water-related disasters. Under the leadership of the councils, various structural and non-structural measures have been implemented nationwide.

In the meantime, municipalities have been doing their part. They review their actions during a disaster afterward, produce a after-action review report, and, in some cases, even post the report on their websites for public purposes. These reports often contain many valuable opinions from municipal personnel, including lessons and ideas for improvement, regarding unsuccessful practices (what we call “cases of critical situations during the emergency response” in this book). Such voices are often found very useful for other municipalities, too, to double-check their actions and plans. In addition, many municipalities report similar cases of critical situations. In other words, municipal personnel often comes across similar troublesome situations, but they can avoid them by learning lessons from other people’s experiences. There have been quite a few incidents from which we regrettably thought those people could have been able to escape if they had known about that case.

To address this issue, the International Centre for Water Hazard and Risk Management (ICHARM) decided to publish a booklet style of publication that is easy for municipal personnel to read and learn about critical situations collected from after-action review reports produced by municipalities. The project was led by Senior Research OHARA Miho under the supervision of Chief Researcher FUJIKANE Masakazu. They first read review reports published by municipalities that suffered significant damage from a flood disaster in the last 20 years and selected about 500 cases with valuable lessons from about 30 publications totaling some 2,000 pages. Those 500 cases were then categorized into 28 situations that municipal personnel is likely to face in case of a disaster. Each situation is accompanied by advice and actions considered appropriate to cope with the situation. The 28 situations are compiled into a handy booklet for individuals and groups to use as learning material about possible situations that may arise in a future disaster.

In planning effective disaster management, we think it is very important for people to see disasters not someone else’s problem but their own problem. It would be our great pleasure if this booklet can be a strong reminder for disaster management officers in municipalities to re-realize that important mentality and a useful source of information for them to increase their individual preparedness for disasters, so that, in turn, they can contribute to strengthening the preparedness of their municipalities.

Finally, please note that the contents of this booklet are subject to change, for we are planning to review it from time to time to update and improve the contents.

June 2020

Toshio Koike, Executive Director,
International Center for Water Hazard and Risk Management
(ICHARM) under the auspices of UNESCO,
Public Works Research Institute (PWRI), Japan

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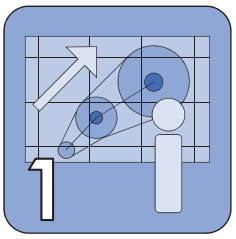
1 Initial Response		1.1 Flooding in government buildings	10
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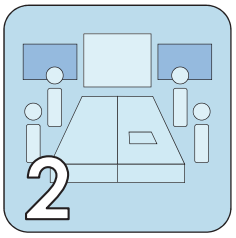
2 Headquarters Management		2.1 Location of disaster control headquarters	20
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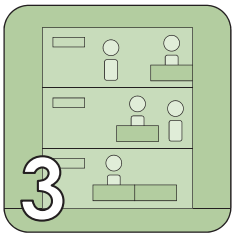
3 Structure in Government Office		3.1 Info sharing in local government office	34
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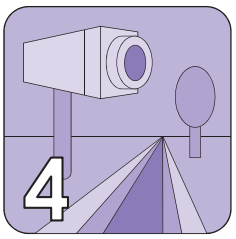
4 Collecting Info		4.1 Collecting water level info	40
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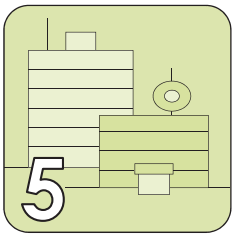
5 Collaborating with Stakeholder Bodies		5.1 Collaborating with disaster prevention bodies	46
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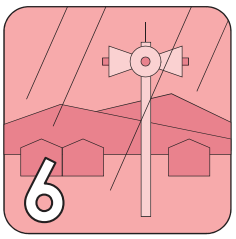
6 Issuing Evacuation Advisory etc.		6.1 Criteria for issuing evacuation advisory, etc.	52
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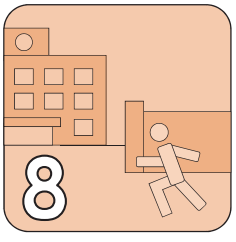
8 Shelters		8.1 Locations of shelters	72
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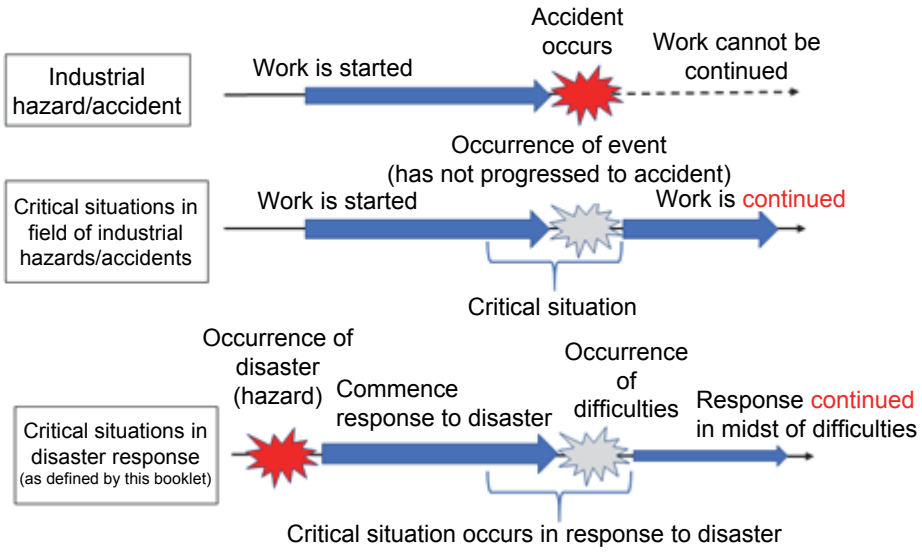
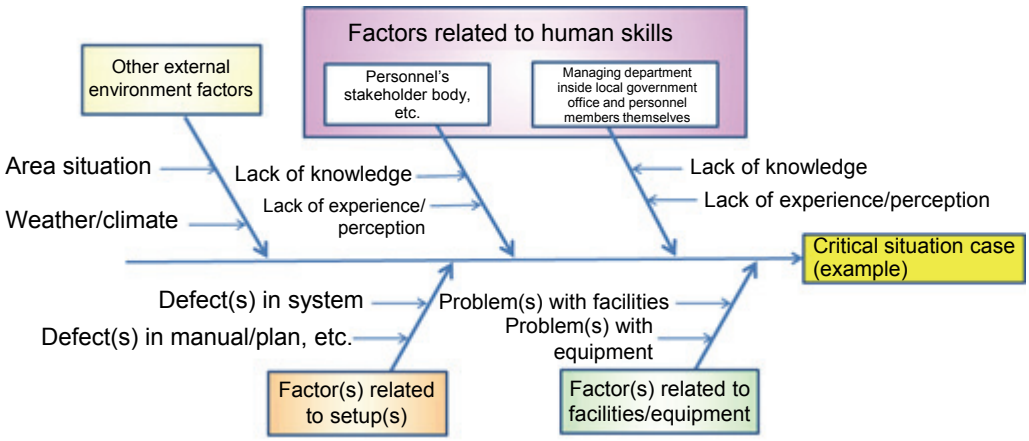
This Booklet's Definition of Critical Situation

- To smoothly respond to disasters, local governments must learn from past disasters and must improve the capabilities of personnel members to enable them to predict in advance the kinds of difficulties that may occur in order to take the necessary advance measures.
- In the field of occupational hazards and accidents, we have gathered critical situations in areas where accidents look likely to occur, putting the details to good use to protect against/prevent reoccurrence of such damage and/or accidents. Whereas, local government disaster managers are tasked with the duty of continuing their response to a disaster even if the situation is descending into "difficulties, panic, confusion, indecision and worries".
- With this booklet, we newly define examples of situations that descend into "difficulties, panic, confusion, indecision and worries" faced by disaster managers as critical situations in disaster response, extracting and introducing typical examples from the verification materials (After action review reports(Post-disaster review reports), etc.) on past flood response actions published by local governments in Japan. With regard to case extraction, we referred to Yotaro Hatamura's book "Learning from Failure" (Kodansha Bunko, 2005). And, the targeted damage phase goes up to establishment of shelters, but does not deal with livelihood reconstruction support or recovery.
- The backdrop to actual critical situations in disaster response includes multiple factors, such as human skills, facilities and procedures, all of which must be addressed in multilayered approaches in advance to optimistically prevent reoccurrence of similar close calls. To that end, as a riposte to the typical cases introduced, we compiled and present in this booklet, in case form, the lessons to be learned from after action review reports published by local authorities and examples of later improvements made by them.
- If these kinds of situations can be predicted in advance in disaster management departments, there is hope that the necessary advance measures can be implemented and the capabilities of personnel members improved to make smooth disaster response.
- Please note that the cases in this booklet are based on disaster knowledge at time of publishing – hence, the contents of this booklet must be updated as needed.

Definitions of Critical Situations during Disaster Response in this Booklet



Factors behind Critical Situations during Disaster Response



Configuration of This Booklet

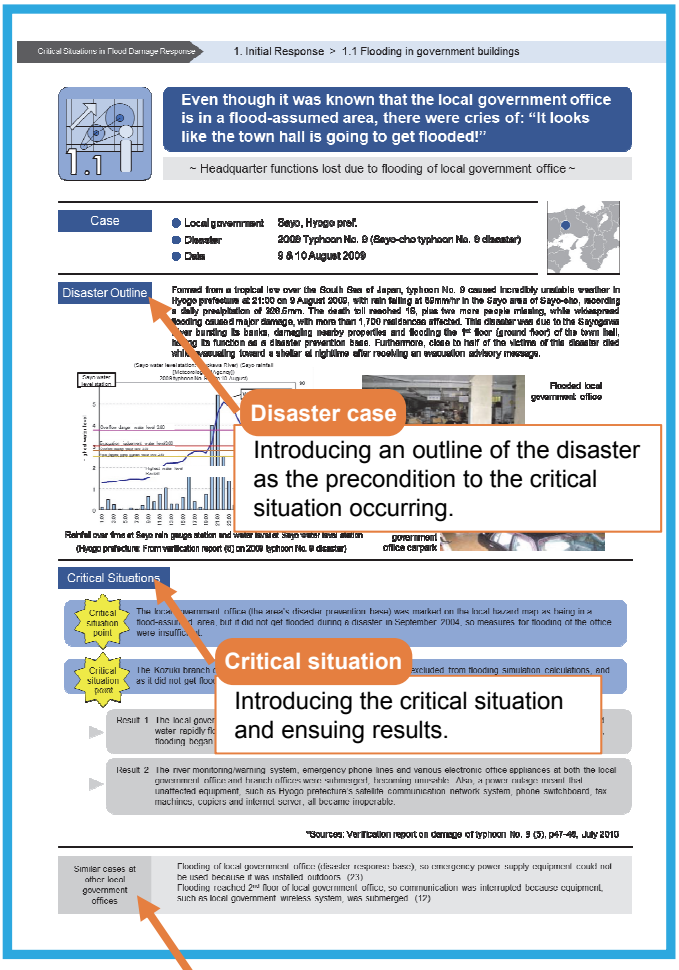
- This booklet is divided into 28 themes in eight chapters that explain actual critical situations of past flooding damage in individually themed double-page spreads.
- The left page provides the close call compilation depicting the disaster case and the close call that occurred at that time, while the right page shows the response compilation depicting lessons to be learned, pointers and relevant guidelines gleaned from after action review reports on past flood disaster responses.

Configured of 28 Themes in Eight Chapters

Individual Themes Explained Across Double-Page Spread

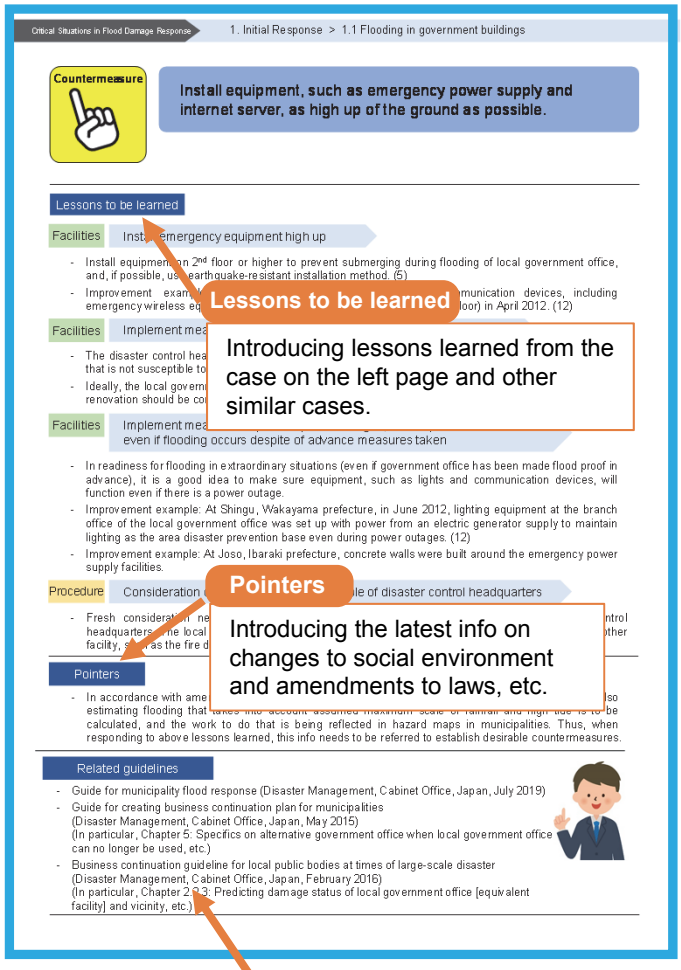
Left Page

Critical Situation Compilation



Right Page

Response Compilation



Disaster case

Introducing an outline of the disaster as the precondition to the critical situation occurring.

Critical situation

Introducing the critical situation and ensuing results.

Introduction of similar cases

Introducing similar cases compiled from local governments.

Lessons to be learned

Introducing lessons learned from the case on the left page and other similar cases.

Pointers

Introducing the latest info on changes to social environment and amendments to laws, etc.

Related guidelines, etc.

Introducing latest info on changes to social environment and amendments to laws.

Points to be aware of at time of disaster and advanced measures configured in a flow for easy comprehension

How to Make Use of This Booklet

●We propose that this booklet should be used in two ways by local governments in preparations to smoothly combat disasters.

1. Using it as training material for individual personnel

(1) By reading the left pages of the 28 themes (eight chapters) on Critical Situations during Flood Emergency Response, individual personnel members can envisage whether similar critical situations might occur in his/her own department and/or the work he/she is tasked with at time of disaster.

(2) If he/she deems that such cases could occur, then reading about the ”facilities”, “procedure” and “human skills” in the right page of the theme concerned should be his/her next step, so that he/she can think about what initiatives should be undertaken in advance and what he/she should pay attention to in the midst of responding to a disaster.

2. Using it as training material for group work and disaster imagination games

(1) Bring members of the department or disaster response unit together, and, depending on circumstances and hour of the day of gathered members, pick one or more of the cases from across the 28 themes and use it/them in combination with the worksheet provided at the end of the booklet to create an image of a disaster situation.

(2) Regarding the chosen case(s), first, print out copies of just the left page, hand them out, and get the gathered members to read the page together.

(3) Once read, each member should think about the following five questions and then write down his/her answers on the worksheet.

(4) Once the answers have been written down, each member should given his/her thoughts on each question, and those thoughts should be debated.

(5) Next, look at the lessons to be learned in after action review reports on past flood disaster responses shown on the right page, and discuss the excesses and deficiencies of the debate in item (4).
In doing this, remember that the left page only renders the natural parameters (such as past rainfall), the terrain controlled by the local government in question and the circumstances at the time of disaster, thus debates need to be conducted with the left page being used to provide pointers as to whether the lessons to be learned are applicable to participant’s own local government or department, etc.

(6) Lastly, draw together measures that are conceivably needed from here on in areas such as “human skills”, “facilities” and “procedure”.

Five questions for critical situations in responding to flood disaster

(1) Could a similar situation occur in your local authority/department?

(2) In particular, are there any conditions that could trigger the same kind of situation?

(3) Are necessary measures (facilities and equipment, etc.) in place to avoid the situation occurring?

(4) Are necessary measures (structures, manuals and plans, etc.) in place to avoid the situation occurring?

(5) Are necessary measures (for improving skills) in place to avoid the situation occurring?

Sources

(1) After action review report pertaining to typhoon No. 23 (Miyazu, July 2005)

(2) Record of damage caused by 2005 typhoon No. 23 (Kyoto prefecture, October 2005)

(3) After action review report on damage of typhoon No. 23 (Hyogo prefecture verification committee on damage of typhoon No. 23, December 2005)

(4) After action review report by verification committee working on Niigata heavy rainfall disaster on 7/13/2004 and 2004 Niigata Prefecture Chuetsu Earthquake (Niigata heavy rainfall disaster on 7/13/2004 and 2004 Niigata Prefecture Chuetsu Earthquake verification committee, January 2006)

(5) After action review report on damage of typhoon No. 9 (Sayo typhoon No. 9 damage verification committee, July 2010)

(6) After action review report on damage of 2009 typhoon No. 9 (Hyogo prefecture typhoon No. 9 damage verification committee, 5 August 2010)

(7) After action review report on damage from heavy rain on 7.15 (Gifu prefecture heavy rain damage verification committee, 21 September 2010)

(8) After action review report on heavy rainfall on 16 July 2010 (Tottori prefecture, September 2010)

(9) After action review report on damage of torrential rain on 7.15 (Kani, 4 November 2010)

(10) After action review report on damage of heavy rainfall in Hofu (Hofu heavy rainfall damage verification committee, December 2010)

(11) After action review report on damage of heavy rainfall in Amami in October 2010 (Amami, Kagoshima prefecture, March 2013)

(12) After action review report on response to damage from 2011 typhoon No. 12 (Shingu anti-disaster headquarters, October 2012)

(13) 13 and 14 August 2012 heavy rainfall damage records for southern part of Kyoto prefecture (Uji, March 2014)

(14) After action review report on damage by localized downpour of short duration on 14 August 2012 (Neyagawa, Osaka prefecture, December 2012)

(15) After action review report on response to widespread flood disaster in Kumamoto (Risk management & disaster prevention section, Kumamoto governor's office, December 2012)

(16) After action review report on damage of heavy rainfall on 28 July 2013 (Yamaguchi verification/study report related to damage of heavy rainfall on 28 July 2013, November 2013)

(17) After action review report on response to localized heavy rain in July and August 2013 (Risk management control section, Tottori prefecture risk management bureau, November 2013)

(18) After action review report on response to damage from heavy rain due to typhoon No. 18 in 2013 (Kusatsu, February 2014)

(19) After action review report on response to urban damage caused by typhoon No. 18 (Disaster prevention & risk management office, Kyoto administration and public finance bureau, December 2013)

(20) Table of verification results on response to damage from typhoon No. 11 (Suzuka disaster risk management department, September 2014)

(21) After action review report for 2014 typhoon No. 11 (Council for promotion of risk management in Yokkaichi, 2015)

(22) After action review report on evacuation measures for heavy rainfall on 20 August (Evacuation measures verification subcommittee on heavy rain on 8.20, January 2015)

(23) After action review report on flooding of Kinugawa River, Joso in 2015 (Joso flood control verification committee, 13 June 2016)

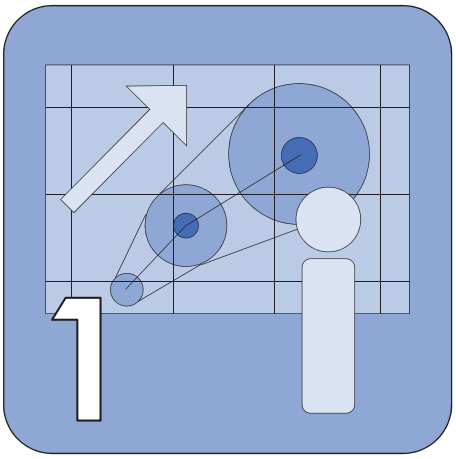
(24) After action review report on response to Kanto-Tohoku heavy rainfall in September 2015 (Ibaraki prefecture, 2016)

(25) We will not forget! Support & restoration record for Kanto-Tohoku heavy rainfall disaster in September 2015 (Ibaraki, August 2016)

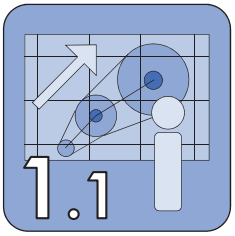
(26) After action review report on response to heavy rainfall in Sapporo on 9.11 (Sapporo, March 2015)

(27) After action review report on response to Kanto-Tohoku heavy rainfall in September 2015 and work to reflect report in disaster prevention measures (Risk management section, prefectural inhabitants' livelihood department, Ibaraki prefecture, 28 March 2016)

(28) After action review report on response to damage from heavy rainfall in northern part of Kyushu in July 2017 (Fukuoka prefecture, March 2018)



Initial Response



Even though it was known that the local government office is in a flood-assumed area, there were cries of: "It looks like the town hall is going to get flooded!"

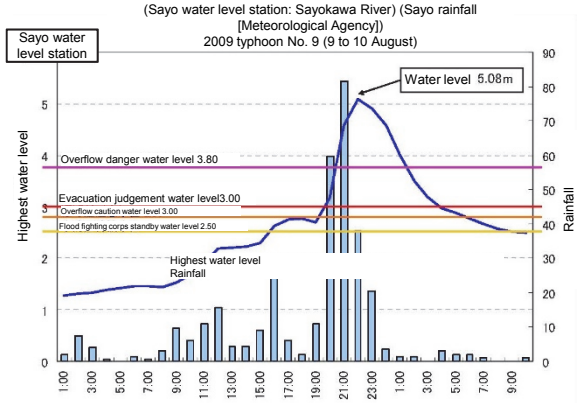
~ Headquarter functions lost due to flooding of local government office ~

Case

- Local government: Sayo, Hyogo pref.
- Disaster: 2009 Typhoon No. 9 (Sayo-cho typhoon No. 9 disaster)
- Date: 9 & 10 August 2009

Disaster Outline

Formed from a tropical low over the South Sea of Japan, typhoon No. 9 caused incredibly unstable weather in Hyogo prefecture at 21:00 on 9 August 2009, with rain falling at 89mm/hr in the Sayo area of Sayo-cho, recording a daily precipitation of 326.5mm. The death toll reached 18, plus two more people missing, while widespread flooding caused major damage, with more than 1,700 residences affected. This disaster was due to the Sayogawa River bursting its banks, damaging nearby properties and flooding the 1st floor (ground floor) of the town hall, halting its function as a disaster prevention base. Furthermore, close to half of the victims of this disaster died while evacuating toward a shelter at nighttime after receiving an evacuation advisory message.



Rainfall over time at Sayo rain gauge station and water level at Sayo water level station

(Hyogo prefecture: From After action review report (6) on 2009 typhoon No. 9 disaster)

Flooded local government office

Flooded local government office carpark

Critical Situations

Critical situation point

The local government office (the area's disaster prevention base) was marked on the local hazard map as being in a flood-assumed area, but it did not get flooded during a disaster in September 2004, so measures for flooding of the office were insufficient.

Critical situation point

The Kozuki branch office is in the Obiyamagawa River basin, an area excluded from flooding simulation calculations, and as it did not get flooded during a disaster in September 2004, the office was not expected to become flooded.

Result 1 The local government office began flooding from about 21:15, after that, the entrance doors became damaged and water rapidly flowed in, flooding the 1st floor (ground floor), approximately one meter deep. At Kozuki branch office, flooding began at about 21:40, inundating the 1st floor.

Result 2 The river monitoring/warning system, emergency phone lines and various electronic office appliances at both the local government office and branch offices were submerged, becoming unusable. Also, a power outage meant that unaffected equipment, such as Hyogo prefecture's satellite communication network system, phone switchboard, fax machines, copiers and internet server, all became inoperable.

*Sources: After action review report on damage of typhoon No. 9 (5), p47-48, July 2010

Similar cases at other local government offices

- Flooding of local government office (disaster response base), so emergency power supply equipment could not be used because it was installed outdoors. (23)
- Flooding reached 2nd floor of local government office, so communication was interrupted because equipment, such as local government wireless system, was submerged. (12)

Countermeasure

Install equipment, such as emergency power supply and internet server, as high up of the ground as possible.

Lessons to be learned

Facilities — Install emergency equipment high up

- Install equipment on 2nd floor or higher to prevent submerging during flooding of local government office, and, if possible, use earthquake-resistant installation method. (5)
- Improvement example: At Shingu, Wakayama prefecture, all communication devices, including emergency wireless equipment, were moved from 2nd floor to 4th floor (top floor) in April 2012. (12)

Facilities — Implement measures to prevent flooding of local government office

- The disaster control headquarters is the cornerstone for dealing with disasters, so establish it in a location that is not susceptible to damage. (5)
- Ideally, the local government office should be moved out of flood-assumed area, but if that is not possible, renovation should be considered, to make the structure flood proof. (5)

Facilities — Implement measures to prevent power outages, so that power is available even if flooding occurs despite of advance measures taken

- In readiness for flooding in extraordinary situations (even if government office has been made flood proof in advance), it is a good idea to make sure equipment, such as lights and communication devices, will function even if there is a power outage.
- Improvement example: At Shingu, Wakayama prefecture, in June 2012, lighting equipment at the branch office of the local government office was set up with power from an electric generator supply to maintain lighting as the area disaster prevention base even during power outages. (12)
- Improvement example: At Joso, Ibaraki prefecture, concrete walls were built around the emergency power supply facilities.

Procedure — Consideration of alternative facilities for role of disaster control headquarters

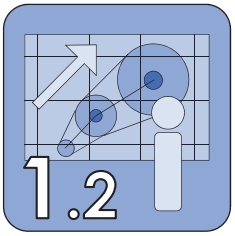
- Fresh consideration needs to be given to the provision of alternative facilities for disaster control headquarters. The local government office also functions as a headquarters, so, as needs dictate, another facility, such as the fire department office or a branch office, should be set up as a substitute facility. (5)

Pointers

- In accordance with amendments to the flood prevention law in 2015, not only estimating flooding but also estimating flooding that takes into account assumed maximum scale of rainfall and high tide is to be calculated, and the work to do that is being reflected in hazard maps in municipalities. Thus, when responding to above lessons learned, this info needs to be referred to establish desirable countermeasures.

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guide for creating business continuation plan for municipalities
  (Disaster Management, Cabinet Office, Japan, May 2015)
  (In particular, Chapter 5: Specifics on alternative government office when local government office can no longer be used, etc.)
- Business continuation guideline for local public bodies at times of large-scale disaster
  (Disaster Management, Cabinet Office, Japan, February 2016)
  (In particular, Chapter 2.2.3: Predicting damage status of local government office [equivalent facility] and vicinity, etc.)



No-one has come to help, so responding to the disaster is out of the question! What should we do?!

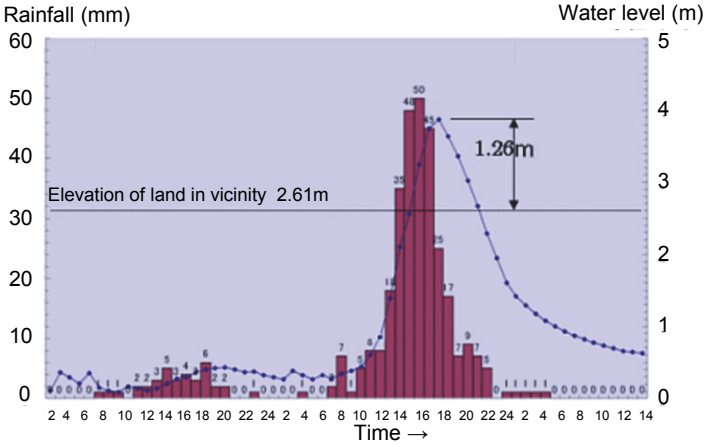
~ There are limits to what untrained personnel can do ~

Case

- Local government: Miyazu, Kyoto pref.
- Disaster: 2004 typhoon No. 23 (2004 Miyazu typhoon disaster)
- Date: Morning of 20th to afternoon of 21st of October 2004

Disaster Outline

On 20 October 2004, a rarely seen super typhoon (typhoon No. 23) passed through the south of Kyoto prefecture, and the strong winds and rain it unleashed on Miyazu left four people dead, 11 properties totally destroyed and many properties severely damaged by flooding below and above floor line due to rivers, such as Otegawa, bursting their banks.



Water level at Kyoguchi Bridge and rainfall at Iwato
(From children's supplementary reader "repairing Otegawa River", Kyoto pref. homepage)

Debris-avalanche that hit the Takiba area (Kanabiki housing development)

Critical Situations

Critical situation point

The division of duties for personnel (each unit) had not been determined in detail.

Result 1 There seemed to be some incidences where initial response did not go smoothly.

Critical situation point

Personnel were not well versed in the use of communication equipment for disaster emergency control.

Result 2 Amidst power outage that disabled phones, personnel failed to make use of government emergency radio installed in the local contact office.

*Sources: After action review report pertaining to typhoon No. 23 (1), p3 and p6, July 2005

Similar cases at other local government offices

- Regarding training for secretariat members, only newly appointed personnel received training, which was insufficient, thus there were only a few members well acquainted with disaster response tasks. (24)
- As no-one had experienced a major disaster in recent years, there was a shortage of disaster response experience among personnel, so, in some cases, the initial response seemed to take time. (13)
- Personnel tried to respond based on flood experiences of the past. (5)
- Only a very few personnel members with experience of responding to disasters, which led to confusion. (2)

Countermeasure

Create a structure to enable the dispatching of personnel to disaster sites and that makes use of retired disaster veterans.

Lessons to be learned

Skill — Change personnel members way of thinking via drilling and training

- An effort must be made to change the way of thinking and ability to take action among personnel members by conducting practical drilling and training. (2)

Skill — Improve the quality of personnel via support from local government

- If disaster control headquarters is based in the local government, initiatives should be taken to improve quality of personnel, such as training disaster managers to provide assistance in emergencies. (24)

Procedure — Deploy specialist personnel

- Consider the importance of the role of primary responsibility in responding to disasters, and, likewise, work to strengthen disaster prevention system by taking actions such as deploying disaster prevention specialists, etc. (3)

Procedure — Produce disaster response manual

- To enable personnel to take smooth initial action in responding to disasters, draw up a personnel response manual, making clear the division of duties and action details for each personnel member, and make sure training is conducted regularly even during normal times. (5)

Procedure — Summon veterans to disaster response headquarters

- Create a structure that enables personnel with past experience in responding to disasters to gather at the disaster response headquarters whenever there is a major disaster. (24)

Procedure — Make use of retired veterans

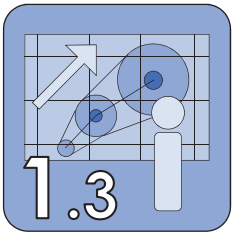
- Take into account that there will be a shortage of manpower during a disaster, so consider using retired veterans and information volunteers, etc. (3)

Procedure — Assistance from prefectures

- To assist municipalities that cannot transmit info due to large-scale damage, prefectures should dispatch liaison officers and support teams to gather info and coordinate, etc. (3)
- To enable municipalities to improve disaster response capability, prefectures should provide advice, such as disaster response knowledge that suits the needs of the municipality concerned, and hold meaningful workshops (visiting lectures, etc.) (3)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- The book of secrets for responding to disasters in municipalities - Protecting citizens at times of disaster (Disaster Management, Cabinet Office, Japan, August 2015)
- Guidelines for local public body support systems at times of disasters (Disaster Management, Cabinet Office, Japan, March 2017)

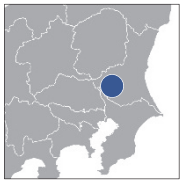


The rain is getting really heavy! When should we switch over to the disaster control headquarters?

~ The difficulty in deciding when to switch over to the system used during disasters ~

Case

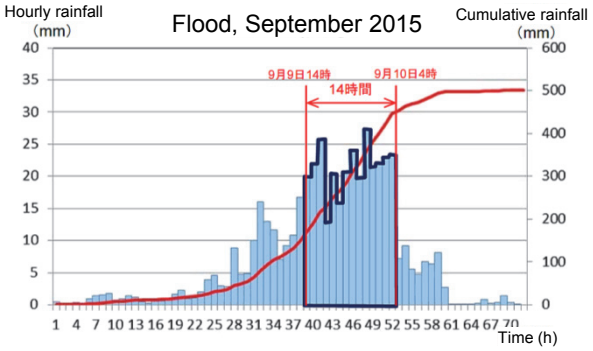
- Local government: Joso, Ibaraki pref.
- Disaster: September 2015 Kanto-Tohoku heavy rainfall disaster (Kinugawa River, Joso, 2015)
- Date: Afternoon of 9th to 11th of September 2015



Disaster Outline

Early morning on the 10th, several parts of Kinugawa River began to overflow and banks to leak. By 12:50, one section of the bank collapsed at Missaka-cho in the city, causing massive damage, with widespread flooding in the area between Kinugawa and Kokaigawa rivers, the deaths of two people, 40 or more people injured and 5,000 or more properties partially or fully destroyed. The city hall, completed in 2014 and featuring the lessons learned from the Great East Japan Earthquake (2011), was inundated with flood water, some 4,300 citizens were rescued, with 1,339 people winched to safety by helicopters.

Rainfall change over time ("Kinugawa River flood damage and recovery circumstances", Kanto Regional Development Bureau) →



Critical Situations

Critical situation point

There were no clear rules about the task of the chief of the disaster control headquarters declaring a switch from normal system to emergency system.

Critical situation point

In response to the time, disaster location and external force by type and outbreak of disaster (including the fear of an outbreak), the preparations were not in place for a clear response between organizational and personnel deployment for action that ought to be taken at times of emergency and the organizational and personnel deployment to be taken at normal times (detailed response that makes it possible to instruct each personnel member on redeployment).

▶ Result: Those responsible were not able to switch without delay from the organizational and personnel deployment geared to providing public services in normal times to the emergency organizational and personnel deployment geared to providing public services necessary in times of emergency (operation of disaster control headquarters, dissemination of info, such as evacuation advisories/orders, and operation of shelters, etc.)

*Sources: After action review report on flooding of Kinugawa River, Joso in 2015 (23), p57-58, 13 June 2016

Similar cases at other local government offices

- In the case of storm and flood damage, the switchover from general work in the flood control system of the river division to a disaster alert system or disaster control system with tasks undertaken by the risk management division is difficult. (18)
- For switchover to flood control headquarters/disaster control headquarters system, the system involved needs to be efficiently strengthened. (16)
- At the time of the disaster, there was no clear criteria for setting deployment system and deployment period at time of storm and flood damage, so, although the setting of a disaster alert headquarters and disaster control headquarters were considered, ultimately the action to set these headquarters was not taken. (14)

Countermeasure

The disaster control headquarters must be quickly established in line with criteria, and the headquarters' chief must declare that the city is in emergency mode.

Lessons to be learned

Skill — Personnel must gain proficiency in understanding weather information

- The relevant personnel members should become skillful at discerning the danger from weather info, such as that presented in weather forecasts and radar images. (9)

Procedure — Sharing weather information with personnel members

- Share weather information, such as weather forecasts, on bulletin boards, via email and in-house broadcasts at the local government office.
- Inform all personnel of homepage(s) handling weather forecasts, so that they themselves can judge how to gather weather information. (9)

Procedure — Increase the number of personnel gathering information

- Increase the number of personnel involved in gathering (reception/transmission), and make this system a thorough one in the control headquarters. (25)

Procedure — Clarify criteria for setting up headquarters

- Review establishing criteria to ensure that the disaster control headquarters is automatically set up in certain cases. (7)

  Improvement example: In Gifu prefecture, the criteria is set so that the disaster control headquarters is automatically set up at times such as when heavy rain, flooding and high winds are all announced, when landslide alert info is announced, when river water level reaches burst danger level and when evacuation advisory is officially announced, etc.

Procedure — Work system switchover is declared by chief of headquarters

- The chief of headquarters must clearly declare the switchover of personnel work system from normal time to emergency time, with the work content that the personnel must familiarize themselves with clearly defined in the local disaster prevention plan. (23)

Procedure — Establish a system for times of emergency that can cope with multiple disaster patterns

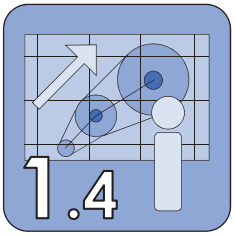
- Across an estimable range, establish in detail the patterns, such as disaster type (flooding, earthquake, etc.), occurrence time, location and extent of damage, and define an emergency system that can actually function in accordance with those patterns. And, to make it function, prepare switchover plan to shift from normal system to emergency system. (23)

Procedure — Implement training that has a high level of reality

- Implement disaster training with a high level of reality imaginable in emergencies, where actions, such as information gathering, analysis and decision-making skills, taken by departments, units and individual personnel members can be verified. (23)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guidelines on evacuation advisory, etc. (2) (official announcement criteria/disaster prevention system edition, Disaster Management, Cabinet Office, Japan, March 2019)
  (In particular, Chapter 8.2: Disaster prevention systems for local public bodies for assumable natural disasters, etc.)



Hardly any personnel members are gathering even though a disaster looks imminent!

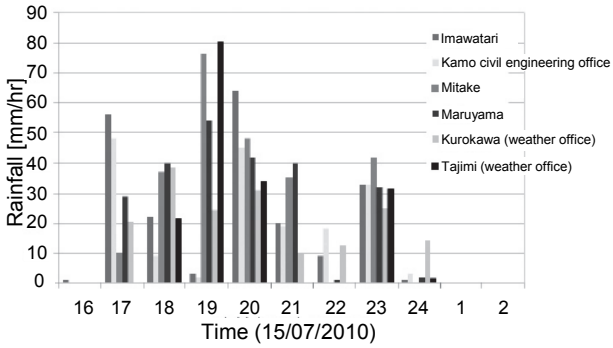
~ Personnel shortages and response tardiness due to difficulty in or slowness in gathering ~

Case

- Local government: Kani, Gifu pref.
- Disaster: 7.15 heavy rainfall (2010 Kani, Gifu prefecture)
- Date: Afternoon of 15th to early dawn of 16th of July 2010

Disaster Outline

Rain started to fall from around 16:00 on 15 July, turning into a thunderstorm that recorded 20mm of rain in a ten minute period on the city hall's rain gauge from 16:20. Thereafter, rain continued to fall intermittently, recording some 270mm of precipitation at the city hall over seven hours from rainfall commencement, making it a record rainfall unmatched in recent years. The style of rainfall varied greatly by area. Kanigawa River burst its banks. Roads were flooded in various areas, properties inundated with water and damage caused by landslides.



Amount of rainfall over time at gauge locations

A scene from in the city

Critical Situations

Critical situation point

There were no instruction to be on standby or precautionary heads up made across entire local government office, and, as rain stopped at 23:00, the personnel in some departments were dismissed at 24:00.

Critical situation point

There had been a call from April for personnel members to register for staff assembly email alerts, but, at the time of the disaster, registration remained at approximately 200 people. In disaster training held from September onward, the plan is to make this registration fully functional.
Also, managerial judgements meant that some departments were not contacted – for example, people forgot to make contact via contact network and there was no sense of responsibility to respond to flooding.

Critical situation point

Some personnel members could not assemble because of family or transport issues.
Some personnel members also waited at home in readiness for work the following day.

Result: Some 20 minutes were needed for the 1st unit of support personnel to assemble in response to the instruction to open community center shelters. In one case, a liaison chief had to run a shelter single-handedly until support personnel arrived.

*Sources: After action review report on damage of torrential rain on 7.15 (9), p40, 4 November 2010

Similar cases at other local government offices

- The personnel mobilization concept did not envisage the impact of personnel assembling late at night or how personnel should travel in heavy rain. (22)
- Personnel members were contacted at an early stage with orders to assemble, but contact was difficult because of the late hour, so it took time. (13)
- An emergency contact network had been created, but contacting personnel members did not go smoothly. (5)

Countermeasure

Assembly rules and multiple forms of communication need to be implemented thoroughly to enable nighttime and holiday assembly.

Lessons to be learned

Facilities — Ensure multiple forms of communication

- Make definite contact with personnel to request assembly by using diverse forms of communication, such as a local government wireless system and email functions on mobile phones. (5)
- Establish a communication system that enables mass broadcast of info, making use of a disaster prevention information broadcast system. (26)

Procedure — Produce a plan that reflects the premise that personnel members will be late or absent.

- On the premise that there will absenteeism among personnel due to the late hour or transport blocks, etc., every effort must be made to ensure that the initial system covers in advance the assembly criteria, such as the need for substitute leaders, first responders and substitute responders as well as assembly points and response work for personnel when there are transport blocks. (2)
- Consider the time required for personnel members to assemble, and establish a system for enabling personnel to assemble quickly by making a deployment organization chart and setting rules to cope with situations where people cannot be reached by phone, and then making all personnel members aware of the deployment organization chart and other measures for assembly. (26)

Procedure — Ensure leeway in staffing

- From the outset, appropriate staffing that accommodates the amount of work in the disaster control headquarters is needed, making sure to have staffing leeway to deal with any unexpected work that emerges. Also, as it may be hard for deployed personnel members to reach their scheduled departments, it is desirable that multiple personnel members are deployed to deal with one task. (5)

Procedure — Produce an assembly criteria manual

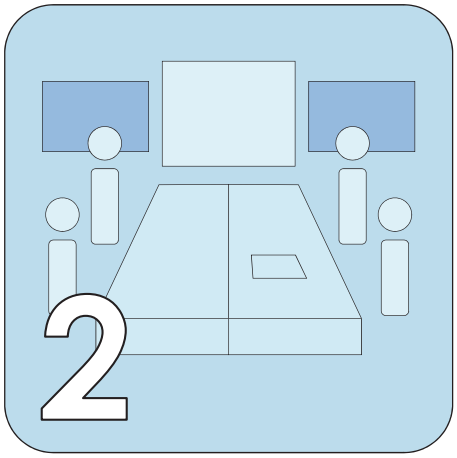
- Produce a clear-cut assembly criteria manual and make all personnel members fully aware of its contents. (27)
- Rules should be laid down for responses when there is an emergency warning, such as automatic assembly of pre-nominated personnel members, and personnel must be made aware of those rules.(19)

Skill — Foster risk awareness among unit members

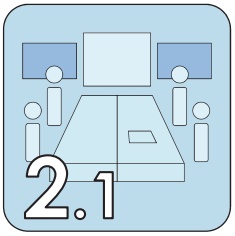
- On a daily basis, work to foster risk awareness among members of all units, instructing them so that they respond to disasters appropriately, and, at the same time, review and overhaul contact network. (18)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guide for creating business continuation plan for municipalities (Disaster Management, Cabinet Office, May 2015)
  (In particular, Chapter 5-1: Clear substitute hierarchy to cope with times when leader is absent and assembly system for personnel, etc.)
- Business continuation guideline for local public bodies at times of large-scale disaster
  (Disaster Management, Cabinet Office, Japan, February 2016)
  (In particular, Chapter 2.4.3: Establishing assembly system for personnel, etc.)



Headquarters Management



What is happening - right now - at that cramped, far-off headquarters?

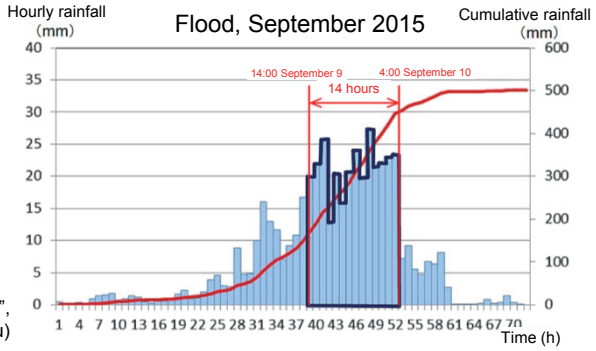
~ Disaster control headquarters failing to function because of a lack of space ~

Case

- Local government: Joso, Ibaraki pref.
- Disaster: September 2015 Kanto-Tohoku heavy rainfall (2015 Flooding of Kinugawa River, Joso)
- Date: Afternoon of 9th to 11th of September 2015

Disaster Outline

Early morning on the 10th, several parts of Kinugawa River began to overflow and banks to leak. By 12:50, one section of the bank collapsed at Missaka-cho in the city, causing widespread flooding in the area between Kinugawa and Kokaigawa rivers, the deaths of two people, 40 or more people injured and 5,000 or more properties partially or fully destroyed. The city hall, completed in 2014 and featuring the lessons learned from the Great East Japan Earthquake (2011), was inundated with flood water, and some 4,300 citizens were rescued, with up to 1,339 people winched to safety by helicopters.



Rainfall change over time ("Kinugawa River flood damage and recovery circumstances", Kanto Regional Development Bureau)

Critical Situations

Critical situation point

Oral messaging by phone and toing and froing was needed because of the excessive distance between the safety & security section (2nd floor on east side of local government building) and the conference room serving as disaster control headquarters (3rd floor on west side of local government building).

Result 1 Not only did this consume the time and energy of personnel, it also became a breeding ground for inaccuracies in transmitting information, including content omissions, confusion and misunderstandings, which impeded the sharing of information and mutual communication between the safety & security section and the disaster control headquarters.

Critical situation point

Designed for council meetings, the conference room lacked sufficient space for personnel from the disaster control headquarters to pursue work and for liaison officers from stakeholder bodies to participate in meetings.

Result 2 For a few days in the initial period, liaison officers from stakeholder bodies (police, fire, SDF, Ibaraki prefecture and MLIT, etc.) were unable to participate in meetings held by the disaster control headquarters, making close collaboration difficult based on the information being shared with those bodies.

*Sources: After action review report on flooding of Kinugawa River, Joso in 2015 (23), p18, 13 June 2016

Similar cases at other local government offices

- It took up valuable time to attend meetings at the disaster control headquarters located in a separate government building, away from the local government office. (20)
- Meeting space was cramped, and information display and collaboration with external bodies was unsuitable. (12)
- The locations and floors differed for disaster prevention manager offices and disaster prevention information system office, so managers had to frequently to-and-fro between offices. (5)
- As the chief and secretariat of disaster control headquarters were in different local government buildings, there looked like there were problems with pooling and sharing information. (1)

Countermeasure

Make sure in normal times that you have a reasonably independent, spacious office available as a disaster control headquarters.

Lessons to be learned

Facilities — Ensure independent office room for disaster control headquarters

- When a disaster hits, risk management personnel members are expected to work in extremely difficult circumstances to gather and analyze information, enabling the resulting response to be swift and precise. For that reason, personnel supervising roles must be cut off from their routine work, and, as much as possible, provided with independent rooms serving as disaster control headquarters or disaster work office. In doing this, consideration must be given to the usual ways in which those rooms (offices) are used. (5)

Facilities — Ensure spacious office for disaster control headquarters

- Use a spacious main conference room as the site for disaster control headquarters. (23)

Facilities — Coordinate deployment space for disaster prevention department

- It is desirable for disaster control headquarters and disaster prevention department to be placed in the same local government building to enable sharing of disaster updates for swift and precise decision making. (1)

- The members of the disaster control headquarters should be placed together with or in adjacent spaces to the secretariat units (general supervision, information and public relations units, etc.), to enable them to share information and smoothly communicate. (23)

Facilities — Ensure office space for stakeholder bodies and others

- For urgent response to a disaster, liaison officers from stakeholder bodies (police, fire, SDF, prefecture and MLIT, etc.) must be in the information sharing loop to enable close collaboration, so space should also be made available to liaison officers from those bodies to facilitate information sharing and smooth communicating between disaster control headquarters and those stakeholder bodies. (23)

- Improvement example: In Joso, Ibaraki prefecture, the disaster control headquarters are set up with office space ensured for liaison officers and support teams.

Pointers

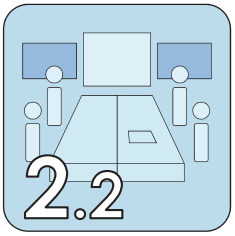
- In considering the location of a disaster prevention headquarters, if you envisage the local government office becoming unusable because of flooding or collapse, then advance consideration must be given to an alternative facility to house the disaster control headquarters.

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)

- Disaster prevention & risk management self-check items (Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, Japan, March 2017)
  (In particular, Chapter 2-1: Installation and operation of disaster control headquarters)

- Toward strengthening the functions of municipal disaster control headquarters ~Case studies on disaster prevention information system~,
  (Civil Protection and Disaster Management Department, Fire and Disaster Management Agency, July 2017)

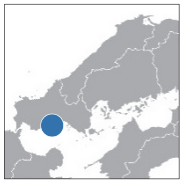


Even though it's headquarters, there's no wireless or TV!

~ Delay in response due to lack of information tools in the room used as disaster control headquarters ~

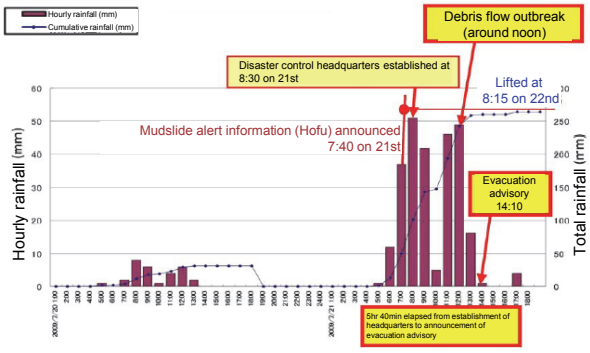
Case

- Local government: Hofu, Yamaguchi pref.
- Disaster: 2009 Hofu heavy rainfall (2009 Hofu heavy rainfall)
- Date: Early morning to late at night on 21st of July 2009



Disaster Outline

From morning to late at night on the 21st of July 2009, widespread heavy rainfall was recorded mainly in the Chugoku region, with numerous landslides occurring in various areas. In Yamaguchi prefecture, there were 159 landslides. In the cities of Hofu and Yamaguchi, mudslides began to flow at about noon on the 21st, causing 14 deaths in Hofu, of which 13 were elderly people of 65 or older. Among damaged properties was a special-care elderly nursing home in the landslide damage potential zone.



Chronological order of rainfall situation and disaster response

A damage scene

Critical Situations

Critical situation point

Disaster control headquarters were set up in the general affairs section (equipment) and river harbor section (consumables), but when a heavy rainfall alert was announced at 4:18 on 21 July, damage reports began to come in from early morning into the river harbor section, and personnel members headed to damage sites to respond; meanwhile, as damage reports started to come into the general affairs section at just after 7:00, that section became the only disaster control headquarters.

▶ Result 1 The disaster control headquarters got underway with uneven stocks of necessary equipment and consumables.

Critical situation point

Citizens gathered information from TV broadcasts, but the headquarters did not have a TV, so the situation could not be grasped, so information gathered at headquarters lagged behind.

Critical situation point

As there was no wireless station in the disaster control headquarters on the 3rd floor (the base station was in the general affairs section on the 2nd floor), the mobile disaster prevention radio was not fully used.

▶ Result 2 The disaster control headquarters was not able to gather the disaster prevention information it ought to have collected.

*Sources: After action review report on damage of heavy rainfall in Hofu (10), p20 and p27, December 2010

Similar cases at other local government offices

- A spacious operation room is needed to share information and smoothly respond to disasters; however, hardly any body involved managed to secure sufficient space. Moreover, there were lots of other problems, such as disaster prevention equipment being stored in different locations in the local government building. (2)

Countermeasure

Also envisage power outages as you develop your procedure for gathering, pooling and sharing information.

Lessons to be learned

Facilities — Prepare facilities in a planned manner

- For disaster control headquarters, prepare facilities that are capable of handling the disaster prevention information that ought to be acquired.
  Prepare facilities in a planned manner, including the installation of TVs and projectors and set up of an intercom system, e-maps and disaster-dedicated external information system. (10)

- Install a base station for a mobile government disaster prevention radio system in the headquarters. (10)

Facilities — Consider what needs to be done at times of power outages

- At times of power outages, the use of all forms of communication equipment, starting with phones and office automation appliances, will not be possible, which will interfere with the gathering and transmission of information, so set up an emergency power supply (generator) in a location that will not become flooded to enable the use of electrical equipment during power outages, and make sure that the generator is serviced and inspected on a regular basis. (5)

Facilities — Servicing and maintaining on a regular basis

- Communication equipment, etc., must be serviced and inspected on a regular basis to ensure that it functions properly. (5)

Facilities — Equip the disaster control headquarters with the necessary commodities at time of establishment

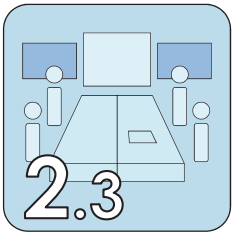
- To swiftly establish the headquarters, reconsider the necessary commodities, and store them in a warehouse near the headquarters; whereas, a system should be set up for commodities that cannot be stored (big goods and leased equipment, etc.) with pre-arranged responsibility placed with personnel members or units that will assemble at the headquarters in a crisis, so that the headquarters can be quickly equipped/stocked and ready to function. (10)

Procedure — The system when establishing the disaster control headquarters

- The task of establishing the headquarters belongs to personnel members, excluding those who are already busy gathering disaster prevention information. (10)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guide for creating business continuation plan for municipalities (Disaster Management, Cabinet Office, Japan, May 2015)
  (In particular, Chapter 5-4: Ensuring various forms of communication that can be easily maintained/kept connected during disasters, etc.)
- Disaster prevention & risk management self-check items (Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, Japan, March 2017)
  (In particular, Chapter 2-1: Installation and operation of disaster control headquarters)
- Toward strengthening the functions of municipal disaster control headquarters ~Case studies on disaster prevention information system~,
  Civil Protection and Disaster Management Department, Fire and Disaster Management Agency, July 2017

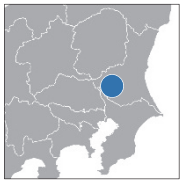


What should my unit do? What's that unit doing?

~ Inadequate rules and roles in operating disaster control headquarters will make it dysfunctional ~

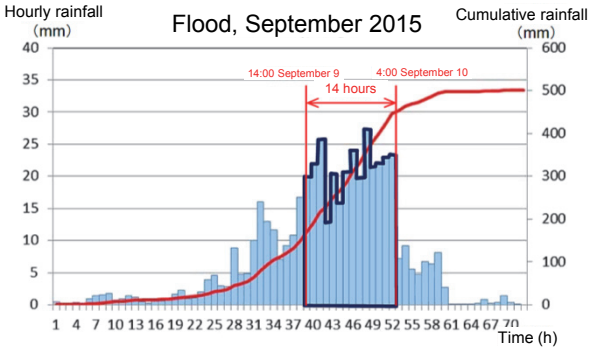
Case

- Local government: Joso, Ibaraki pref.
- Disaster: September 2015 Kanto-Tohoku heavy rainfall (September 2015 major flooding on Kinugawa River, Joso)
- Date: Afternoon of 9th to 11th of September 2015



Disaster Outline

Early morning on the 10th, several parts of Kinugawa River began to overflow and banks to leak. By 12:50, one section of the bank collapsed at Missaka-cho in the city, causing widespread flooding in the area between Kinugawa and Kokaigawa rivers, two people died, 40 or more were injured and 5,000 or more properties were partially or fully destroyed. The city hall, completed in 2014 and featuring the lessons learned from the Great East Japan Earthquake (2011), was inundated with flood water, and some 4,300 citizens were rescued, with up to 1,339 people winched to safety by helicopters.



Rainfall change over time ("Kinugawa River flood damage and recovery circumstances", Kanto Regional Development Bureau)

Critical Situations

Critical situation point

In response to the time, disaster location and external force by type and outbreak of disaster, the preparations were not in place for a clear response between organizational and personnel deployment for action that ought to be taken at times of emergency and the organizational and personnel deployment to be taken at normal times.

Critical situation point

There was no clear plan for switching over from normal organizational and personnel deployment to the emergency organizational and personnel deployment.

Critical situation point

Realistic training was not undertaken to check response skills, such as how each department, each unit and each personnel member at the disaster control headquarters gathers and analyzes information, and uses it in decision making.

Result: The general affairs unit of the disaster control headquarters secretariat, cored around the security & safety section, was overrun with phone calls from citizens and news media, making it impossible for the secretariat to fulfill its conventional responsibilities. Despite this, many of the personnel members had not switched their minds to emergency mode, so, overall, their time was not used effectively.

*Sources: After action review report on flooding of Kinugawa River, Joso in 2015 (23), p57, 13 June 2016

Similar cases at other local government offices

- The division of duties among each unit was arbitrary, leading to big differences in the work to be tackled and the personnel system used, depending on the unit in question. (13)
- The organization is such that the chief of headquarters is the head of the unit system, but the relationship between personnel members and units was not made clear. (13)

Countermeasure

Establish a “disaster response manual” that makes clear in detail “when and what” each person should be doing.

Lessons to be learned

Procedure: Produce manual and get personnel members to familiarize themselves with the contents

- Prepare a manual for efficiently handling emergency work in the disaster control headquarters even with a limited number of people. (19)
- Produce duties for each unit and manuals for individual units, correct them accordingly, and make personnel members fully aware of contents in April each year when personnel transfers are made. (18)

Procedure: Inform all personnel members about any switchover to disaster mode

- At the appropriate stage after the disaster control headquarters has been established, the chief of the headquarters will declare a switchover from the normal work system to “emergency response mode”, and all local government personnel must be made aware of that switchover. (23)

Procedure: Not everybody should respond. There needs to be a division of roles.

- In the disaster control headquarters, roles ought to be clearly divided into “information analysis”, “countermeasure planning” and “checking & approving”. By dividing roles like this, the overall situation must be comprehensively grasped and sufficient checks implemented to find deficiencies in countermeasure details. (23)

Procedure: The disaster prevention section dedicates itself to secretariat and staff functions

- As the general affairs unit in the disaster control headquarters, the role of the personnel members in the disaster prevention section must be dedicated to secretariat and staff functions. Namely, support staff from another department must handle phone calls with inquiries aimed at the disaster prevention section. (23)

Procedure: Let public relation officer and related bodies be present at headquarters

- Keep the public relations officer who provides news to the public and deals with the news media present at the disaster control headquarters, as moves made by the headquarters need to be grasped for dissemination. Also, liaison officers for stakeholder bodies (police, fire, SDF, prefecture and MLIT, etc.) must be allowed to participate as well. (23)

Procedure: Ensure leeway in system

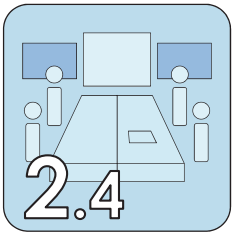
- To respond flexibly to the emergence of work (special provisions) not originally envisaged, or consideration of a new measure/system, the work system drawn up must have leeway in terms of the personnel members deployed in the secretariat. (3)

Procedure: Implement management imagination games for disaster control headquarters

- Use operation diagram of disaster control headquarters to play management imagination games, while also setting to work sequentially the information gathering unit and public relations unit under the normal flood prevention system, so that the units build up experience during normal duties and learn how to respond to large-scale disasters. (18)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Toward strengthening the functions of municipal disaster control headquarters ~Case studies on disaster prevention information system~,
  (Civil Protection and Disaster Management Department, Fire and Disaster Management Agency, July 2017)
  (In particular, Chapter 4-2: Clarifying division of roles in disaster control headquarters)

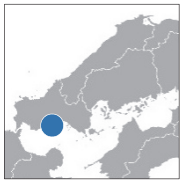


There's a mountain of information coming! Which is the important info?

~ Decision-making delays due to inefficient gathering, compiling and analyzing of information ~

Case

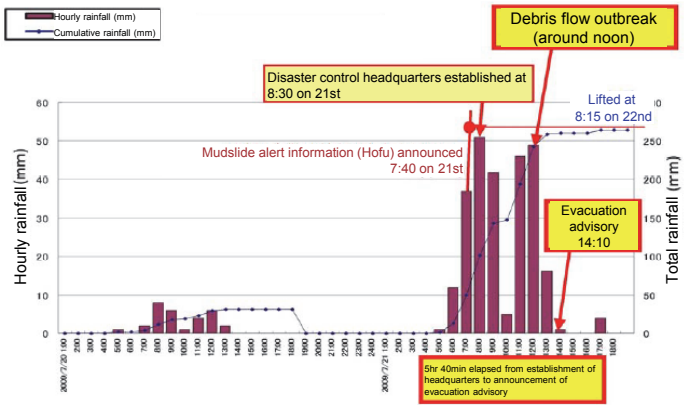
- Local government: Hofu, Yamaguchi pref.
- Disaster: 2009 Hofu heavy rainfall (2009 Hofu heavy rainfall)
- Date: Early morning to late at night on 21st of July 2009



Disaster Outline

From morning to late at night on the 21st of July 2009, widespread heavy rainfall was recorded mainly in the Chugoku region, with numerous landslides occurring in various areas. In Yamaguchi prefecture, there were 159 landslides. In the cities of Hofu and Yamaguchi, mudslides began to flow at about noon on the 21st, causing 14 deaths in Hofu, of which 13 were elderly people of 65 or older. Among damaged properties was a special-care elderly nursing home in the landslide damage potential zone.

Chronological order of rainfall situation and disaster response→



Critical Situations

Critical situation point

Because there were so many disaster checklist form reports with data about onsite situation and response being received (onsite situation), the staff could not handle all of them individually, which meant there was information that could not be reported to the headquarters.

Result 1 After personnel from stakeholder sections investigated disaster sites using checklist form reports, there were some personnel who are unable to file reports to the disaster control headquarters, which meant the headquarters did not have the full picture about the situations at disaster sites.

Critical situation point

Disaster information came into the disaster control headquarters and fire department headquarters separately, causing congestion because it was not centralized.

Result 2 Information could not be centralized, and so confusion emerged about the latest information.

Critical situation point

The necessary hotline was in place to transmit information to the national government, but it did not work.

Result 3 The latest weather information could not be passed on to the staff in the headquarters.

*Sources: After action review report on damage of heavy rainfall in Hofu (10), p22, p27 and P29, December 2010

Similar cases at other local government offices

- There were cases where general damage information and information provided by police and fire services were not shared by prefectural stakeholder bodies and municipalities. (17)
- The amount of damage information was immense and required a great effort to aggregate and compile. Also, regarding decisions and information at the disaster control headquarters, some transmission confusion surfaced because of insufficient sharing of decisions and information with ordinary personnel members. (13)
- Various types of information exacerbated the situation and caused conflict, so scrutiny of required information was necessary. (12)
- There was a need for a reception desk at the outset to gather information. (11)

Countermeasure

First, start by creating a system to handle immense amounts of information.

Lessons to be learned

Procedure Set up units that specialize in gathering and analyzing information

- Establish a unit to deal with information analysis and strategy planning and another one to deal with information gathering and broadcasting in order to strengthen information analysis function. (3)

Procedure Set information classification standard

- In advance, set the information classification standard and the procedures to deal with that standard, then carry out a pre-check of all that, so that you can smoothly classify information when a disaster occurs, and get on with the task of grasping an overall image of the disaster. (13)
- The greater the damage is the more likely information will not come in swiftly, so consider creating a structure that can generally analyze fragmentary damage reports and rain amounts and water levels to enable you to join the dots to make damage forecasts and policy decisions. (3)

Procedure Improve how information is reported and processed, and make use of the geographic information system (GIS).

- Consider ways of improving how information is reported and processed as well as how information formats can be integrated. Making use of systems such as GIS as an information sharing system is a essential. (2)
- As much as possible, reports should be accompanied by photos or video clips (make use of smartphone photos, etc.). (12)

Procedure Centrally manage and share information in the disaster control headquarters

- Establish an information processing system to ensure accuracy and centralized management, so that information that is handled is the kind that ought to be gathered and ought to be known about. And, to make the most of the latest information, swiftly document it (produce a disaster compendium, etc.). (12)
- Display the chronological order on a whiteboard for each information source, for say information from the prefectural office and information from the volunteer fire corps, etc., and then, at fixed times, that information should be shared with personnel members. (9)
- Improvement example: In Tottori prefecture, as soon as the contents of general damage reports have been compiled, they are uploaded to a homepage for public viewing, in an effort to let stakeholders share information.

Procedure Make good use of hotlines and agreements

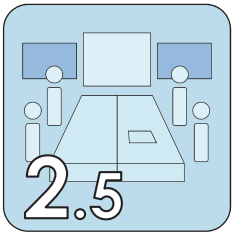
- Improvement example: In times of emergency in Hofu, Yamaguchi prefecture, hotlines are established between the national government, prefectural government, city mayor and the director of disaster risk management.
- Consider entering into disaster agreements to receive information from companies, such as construction firms. (10)

Skill Improve personnel skills in gathering and processing information

- Many pieces of available disaster information will be transmitted via the internet, yet the work environment for that tends to prompt the overlooking of important information. Therefore, planned maintenance of facilities and training of personnel members capable of doing that work needs to be undertaken, so establish a specialist unit to gather and process information coming into the disaster control headquarters, to improve gathering and transmission functions. (10)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guideline on how to make use of hotlines for small-to-medium-sized rivers (river environment section, Water and Disaster Management Bureau, Ministry of Land, Infrastructure, Transport and Tourism (MLIT) , February 2017)



I can't get my disaster control headquarters work done because I have to keep answering the phone!

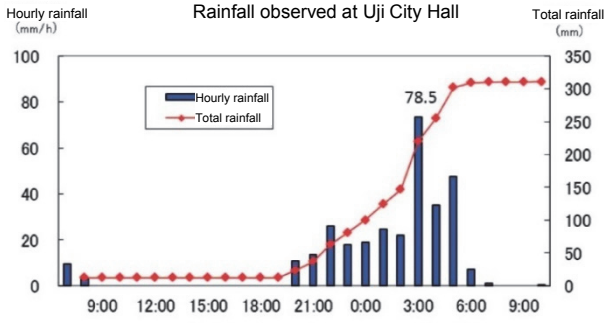
~ Staff & lines monopolized due to phone inquiry jam ~

Case

- Local government: Uji, Kyoto pref.
- Disaster: 13 & 14 August 2012 heavy rainfall for southern part of Kyoto prefecture (heavy rainfall, Uji, 2014)
- Date: Afternoon of 9th to 11th of September 2015

Disaster Outline

From 13 to 14 August 2012, a total of 311mm of rain at a maximum hourly rate of 78.5mm fell in Uji, causing the Midajirogawa River to burst its banks and other rivers, such as Shizugawa, Ikusagawa and Niidagawa, to overflow. The damage was immense, with two people dead, more than 2,000 properties damaged, numerous roads and rivers damaged by landslides and debris flows, and agricultural and forestry land, such as tea and rice fields, damaged by debris flows. In particular, mountainous areas, such as Sumiyama, were left isolated after roads and lifelines were cut off.



Amount of rainfall at Uji city hall (13 & 14 August)

The burst Mitajirogawa River (morning of 14th of August 2012)

Critical Situations

Critical situation point

From the outset, personnel members were overwhelmed by phone calls from the public, detailing various issues from requests for rescue to situation updates; hence, it was a struggle to respond given the different levels of priority and importance.

Result 1 The important information needed to conduct initial onsite investigations could not be distinguished, so it took time to grasp an overall image of the disaster, which hindered any attempts at swift disaster response that followed.

Critical situation point

The checklist card (for asking about onsite situation, etc.) prepared for phone inquiries had numerous checklist questions, so each individual call took too much time.

Result 2 Reports could not be made to the headquarters, so there were cases where information was not shared among everyone.

Critical situation point

Phone calls to the disaster control headquarters all went through a city hall representative number, so when calls were at their peak, the line was always engaged.

Result 3 There were delays in transmission of emergency information and making contact with personnel members.

:*Sources: 13 and 14 August 2012 heavy rainfall damage records for southern part of Kyoto prefecture (13), p11, March 2014

Similar cases at other local government offices

- Supervising unit were overwhelmed by the task of responding to phone calls, which meant the disaster control headquarters' secretariat/staff hardly managed to get done any of the work they ought to do. (23)
- We were overwhelmed by phone calls from the public, which meant, at the outset, we could not appropriately attend to meetings in the disaster control headquarters or manage the risk management center. (21)
- We were overwhelmed by phone calls at night. The calls were so numerous that the supervising section could not handle them all. (9)

Countermeasure

Phone calls are handled by system for entire local government. So, in-house information must be shared, too.

Lessons to be learned

Facilities — Ensure dedicated phone lines for stakeholders

- To prevent the adverse effect of phone line congestion, dedicated lines (with notification of priority phone numbers for stakeholder bodies, etc.) should be set up in tandem with the establishment of the disaster control headquarters. (13)

Procedure — Prepare a system that enables swift set up of dedicated phone lines

- Prepare a system that will swiftly establish dedicated direct dial phone lines in cases of disaster. (14)

Procedure — Build up a phone system that covers the entire local government

- Change public awareness to direct disaster-information-related phone calls to the disaster prevention section, as a system that covers the entire local government must be set up to deal with external contact/inquiries at times of disaster. (23)
- Appoint personnel to refer phone calls to section handling external calls and others to handle phone calls, and make sure that calls are dealt with concisely to enable a greater influx of information. (9)

Procedure — Dedicate disaster prevention section to the tasks of secretariat and staff functions

- At the time when the disaster control headquarters is established, personnel from a different department should handle phone calls for the disaster prevention section, so that the latter can dedicate themselves to the role of being a general affairs unit to handle the tasks of the secretariat and staff functions for the disaster control headquarters. (23)

Procedure — Augment personnel deployment in stages in accordance with weather information

- To handle a disaster outbreak, it is essential to swiftly gather and prepare information, to then implement initial disaster response, so deploy personnel from the moment an official warning is given, further augment them when alerts are given, and task them with the jobs of gathering and preparing weather information, etc. (10)

Procedure — Make use of designated format from normal times

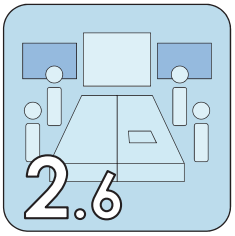
- Use the everyday common phoning format to deal smoothly with phone calls during disasters. (9)

Skill — Improve personnel skills through training

- Continuously train personnel to improve their knowledge and response capabilities. (21)
- Improvement example: In Yokkaichi, Mie prefecture, training for the operation of a disaster control headquarters (storm/flood/earthquake) is held twice a year, to improve staff knowledge and response capabilities.

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guide for creating business continuation plan for municipalities (Disaster Management, Cabinet Office, Japan, May 2015)
  (In particular, Chapter 5-4: Ensuring various forms of communication that can be easily maintained/kept connected during disasters, etc.)



I've come to help, but what should I do?

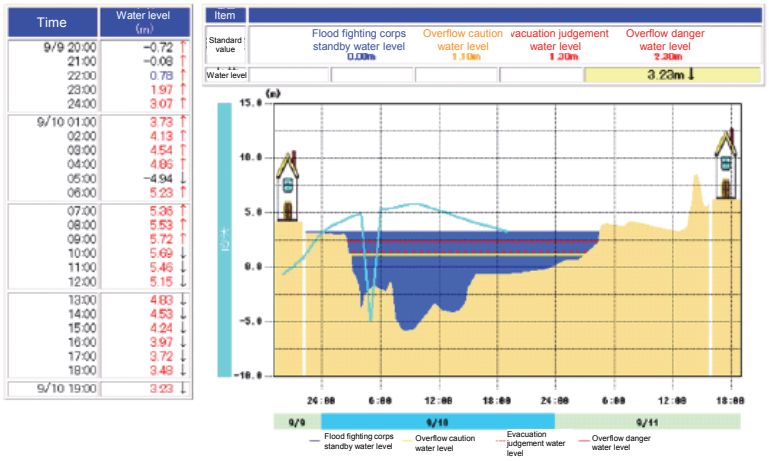
~ As the roles of and procedures for support personnel are not sufficiently laid out in manuals, there is confusion as to what they should do ~

Case

- Local government: Ibaraki pref.
- Disaster: September 2015 Kanto-Tohoku heavy rainfall (heavy rainfall, Ibaraki pref., 2015)
- Date: Afternoon of 8th to afternoon of 10th of September 2015

Disaster Outline

According to the Meteorological Agency, the impact of moist air coming in from the south due to typhoon No. 18 (and when it changed to a low pressure front) caused heavy rainfall across a widespread area from west to north Japan – in particular, it brought record rainfalls to the Kanto and Tohoku regions. In Ibaraki prefecture, a special heavy rain warning was announced at 7:45 on the 10th. The water level of Kinugawa River rose on the 10th, overflowing in the Wakamiyado area of Joso and then bursting its bank at Missaka in Joso, leading to widespread flooding in Joso. According to Ibaraki prefecture's summary of the damage in the prefecture, there were 5,000 or more properties partially or fully destroyed.



Changing water level at Kawashima water level monitoring station (river disaster prevention information homepage, MLIT)

Critical Situations

Critical situation point

Specific tasks to be undertaken by personnel dispatched to Joso from prefectural office were not arranged in advance.

Result 1 The prefectural personnel were not briefed on who (specific personnel) to support before being dispatched.

Critical situation point

Local authority support personnel could mostly only help for half a day or during daytime.

Result 2 There was a shortage of personnel at nighttime and weekends, making division of roles difficult

*Sources: After action review report onresponse to Kanto-Tohoku heavy rainfall in September 2015 (24), p7

Similar cases at other local government offices

- Regarding the dispatch of liaison personnel from prefectural disaster control headquarters to the damaged municipality, the personnel had not been trained, and they were not prepared because they were dispatched urgently. (15)
- As prefectural disaster control headquarters' office space was cramped, the liaison officers from the Cabinet Office, Fire and Disaster Management Agency, SDF, Kyushu Regional Development Bureau, Police and other prefectures could only be offered meagre space to work in. (15)
- We asked for support personnel from all agencies; however, as they came for just a day and rotated, disaster response moved ahead without us being able to accumulate knowledge from our response to the public's needs. (14)

Countermeasure

Make support contents clear in agreements, etc. Also implement mutual training.

Lessons to be learned

Procedure — Consider in advance the roles of the assisting side and the assistance-receiving side

- Regarding the dispatching of personnel to damaged municipalities, rules need to be laid down, such as coordinating in advance with the municipalities in question, including the work content of dispatched personnel, as well as briefing dispatched personnel at the onsite headquarters or by the municipality in question. (24)

Procedure — Prefectures should establish support systems to help damaged municipalities

- A support structure at prefectural level needs to be established, so that when a large-scale disaster has occurred, the prefectural and municipal personnel who are dispatched have the knowledge and experience to respond to disasters in order to help damaged municipalities that are in a state of confusion when it comes to swiftly and precisely implementing initial emergency response because they have problems, such as a lack disaster-response know how, are short on experts or their local government building is damaged. (6)
- Improvement example: From lessons learned in Hyogo prefecture, in September 2010, the Hyogo emergency support taskforce was formed to offer emergency assistance to local authorities that experience disaster. Up to now, the taskforce has helped out in local disasters, such as the 2014 Tamba heavy rainfall, and in disaster areas covered by the Great East Japan Earthquake.

Procedure — Create rules and manual for support personnel

- Create fixed rules and a manual for a support personnel deployment system that takes into account the contents of support work and the amount of work. (14)
- Periodically visit the city, and make the gathering of information on municipalities a task of the prefectural onsite headquarters, and create a manual. (24)

Procedure — Take into consideration the rotation of personnel

- Presumably, deployment may be prolonged, so a takeover method for substitutions (takeover time, transmission method, contact format, etc.) must be established, including meticulous rotation of personnel and creation of job sheets. (3)

Skill — Improve personnel skills through training

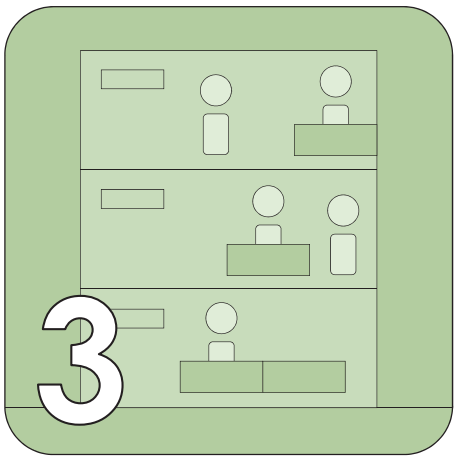
- Thoroughly train personnel for a support personnel deployment system that takes into account the contents of support work and the amount of work. (14)

Facilities — Prepare items to be carried by support personnel

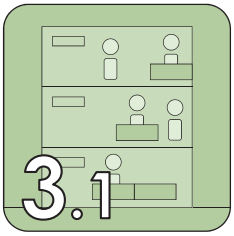
- In advance, implement workshop and prepare the items to be carried. (15)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guidelines for local public body support systems at times of disasters (Disaster Management, Cabinet Office, Japan, March 2017)



Structure in Government Office



Please explain the current situation!

~ Confused response due to insufficient sharing of information in the local government office ~

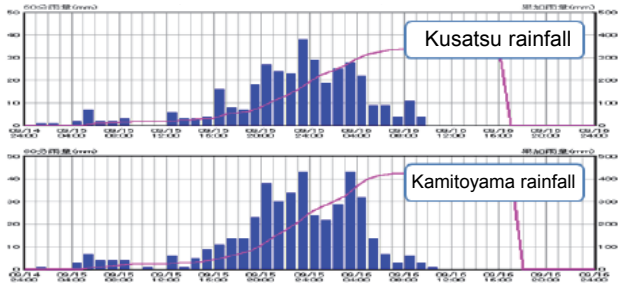
Case

- Local government: Kusatsu, Shiga pref.
- Disaster: 2013 typhoon No. 18 heavy rainfall (2013 heavy rainfall, Kusatsu)
- Date: 15 to 16 September 2013

Disaster Outline

A disaster control headquarters was set up to tackle the heavy rainfall from typhoon No. 18 of 15 and 16 September 2013. In the city, two residences were inundated with water under the floor, 53 mudslides occurred, sewers overflowed, arable land was damaged, but no first-class river succumbed to overflows or bank bursts, and there was no human damage.

Total rainfall from 00:00 on 15/09 to 24:00 on 16/09



Kusatsu rainfall observation station
Hourly maximum rainfall: 38mm/hour
24hr rainfall: 337mm
Total rainfall: 355mm

Kamitoyama rainfall observation station
Hourly maximum rainfall: 43mm/hour
24hr rainfall: 412mm
Total rainfall: 436mm

Rainfall graphs from Kusatsu rain gauge station (Kamitoyama, Kusatsu)

Overflow in the city

Critical Situations

Critical situation point

The contents of meetings held at headquarters, such as damage status and response status in the city, was not shared as far down the chain of command as each unit in the departments.

Critical situation point

In particular, personnel who sequentially turned up for work thanks to the augmentation of personnel did not know about the damage status or response status in the city.

Result Response was implemented without important items of information being shared among the personnel in the local government office.

*Sources: Summary & After action review report on response to damage from heavy rain due to typhoon No. 18 in 2013 (18), p8, February 2014

Similar cases at other local government offices

- The personnel outside of the local government meeting room were told very little about the considerations and decisions being made by the disaster control headquarters, creating an information and awareness disparity between personnel on the inside and those on the outside of the local government meeting room. (23)
- Due to multiple incidents of damage, we were unable to share information in the local government office by swift gathering, reporting and contacting, and there were some delays in responding to the needs of the public. (19)
- As information sharing was insufficient, there was a lack of information given to the public and onsite responders, which led to onsite confusion. (12)
- Damage information that entered the disaster control headquarters did not get shared in the local government office. (9)
- The contents of decisions made in meetings in the disaster control headquarters were not processed and transmitted to personnel, so a disparity in information awareness emerged between personnel (units), which led to confusion in dealing with the public. (1)

Countermeasure

Establish a structure that enables sharing of information in local government office, such as in-house broadcasting and in-house LAN.

Lessons to be learned

Procedure — Make all personnel aware of information

- After a meeting at headquarters ends, unit leaders in departments should hold a meeting, in particular to meticulously share the important points of available information. (18)
- Regarding the items of decisions made by the disaster control headquarters, the local government office broadcasting system, etc., should be used to make personnel outside of the disaster control headquarters periodically aware of the detailed individual instructions and key points of the information passed onto subordinates from the managers of the members in the headquarters. (23)
- Use local government in-house email to send response status to all personnel so that it is shared among all personnel, to enable them to respond and mobilize swiftly to the various tasks. (16)

Procedure — Make rules for sharing information

- Decide on a structure for sharing information from in the secretariat, such as holding periodic meetings for unit leaders. (24)
- Consider making rules for the provision of advance weather information from the weather station to the stakeholder departments in the local government office. (26)

Procedure — Systemize the compiling and recording of information to facilitate the sharing of it

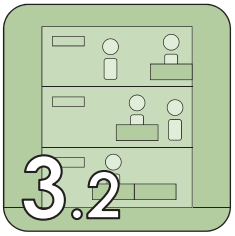
- Display the chronological order on a whiteboard for each information source, for say information from the prefectural office and information from the volunteer fire corps, etc., and then at fixed times that information should be shared with personnel members. (9)
- Establish a system to appropriately keep a record of activities, such as setting up a “recording unit” in the headquarters secretariat, and compile a manual for that system. (24)
- Make templates for headquarters’ meeting materials and publication materials, and also determine the compilation rules and lay them down in a manual. (24)

Facilities — Strengthen the disaster prevention information sharing system

- Manage the latest disaster response situation, and consider introducing a disaster information management system to aid the sharing of information to all personnel. Also, until that introduction is made, express information in the typical way by utilizing the existing system, such as posting the material from meetings at headquarters on an electronic bulletin board. Other such actions could include the timely sharing of advance information on approaching typhoons, etc. (18)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Disaster prevention & risk management self-check items (Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, Japan, March 2017)
  (In particular, Chapter 2-1: Installation and operation of disaster control headquarters)
- Toward strengthening the functions of municipal disaster control headquarters ~Case studies on disaster prevention information system~,
  (Civil Protection and Disaster Management Department, Fire and Disaster Management Agency, July 2017)



Why am I the only one who is this busy! That unit look like they've got nothing to do.

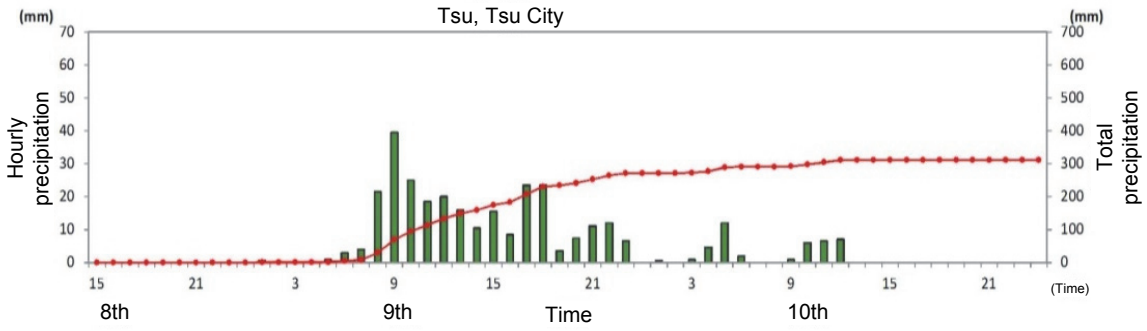
~ The difficulty of maintaining a disaster response system due to bias in workload ~

Case

- Local government: Suzuka, Mie pref.
- Disaster: August 2014 typhoon No. 11 disaster (2014 Suzuka heavy rainfall)
- Date: Afternoon of 9th to early dawn next day of August 2014

Disaster Outline

Typhoon No. 11 passed through Mie prefecture, causing a record-breaking downpour, so that a special warning for heavy rainfall was announced on 9 August Damage included flooding from heavy rain and stripping of roof tiles by high winds, while the combination of high winds and heavy rain seriously effected transportation, such as railways, air travel and expressways.



Transition of rainfall (Mie pref. weather flash from Tsu weather station related to typhoon No. 11 in 2014)

Critical Situations

Critical situation point

With the official announcement of an evacuation advisory for Ota-cho, the construction unit was tasked with checking the evacuation situation and finding out the water level of rivers, but they were so busy with the emergency response that they did not have the leeway to fulfill those tasks.

Result 1 As the construction unit was so busy, consideration needed to be given to finding another unit to carry out the tasks.

Critical situation point

The repair unit assesses and repairs damaged public facilities, but as there was minimal damage to public facilities during the heavy rainfall, some members of the repair unit supported the work of the construction unit but the majority were left on standby.

Result 2 As a surplus of personnel occurred, the deployment system needs to be reviewed in accordance with situations.

*Sources: Table of verification results on response to damage from typhoon No. 11 (20), p3, September 2014

Similar cases at other local government offices

- The work rotation was not decided for personnel in the secretariat. (24)
- The number of participating personnel was greatly increased, but as there were issues with clarifying division of roles pertaining to efficient deployment and emergency response work, a disparity in workload emerged among personnel. (19)
- The division of duties for each unit was haphazard, leading to massive disparities in workload and personnel configurations, depending on the unit in charge. (13)
- The work of each unit diversified, lengthened in time and had to be done by a small number of people, so a strenuous period of work continued for some time. Furthermore, due to application of the disaster relief act and act concerning support for reconstructing livelihoods of disaster victims, work converged on certain units, which caused disparity in workloads between different groups. (12)

Countermeasure

Allocate work appropriately based on workloads that take into consideration several disaster response scenarios.

Lessons to be learned

Procedure Consider deployment system based on attributes of disaster

- With regard to the deployment system in the operating manual of the disaster control headquarters, consider separating deployment for storm/flood disaster and earthquake disasters. (20)
- In particular, the initial response to storm/flood disasters sees a concentration of work in the construction department, so consideration should be given to adding substitution personnel to the mobilization system or providing personnel from other departments. (18)

Procedure Strengthen support system based on understanding of and situation related to number of people deployed

- When establishing the disaster control headquarters, the number of people to be deployed from each department should be reported to the disaster control headquarters and, if support is needed, the number of personnel required should be reported to headquarters, with the a clear record of the strengthening of the support system made in the manual. (21)
- Improvement example: In Yokkaichi, Mie prefecture, personnel reports, etc., made when the disaster control headquarters is established are clearly listed in the manual.
- As voluntary cooperation is difficult during periods of uncertainty about the situation, if support is required, the department with primary responsibility should make a request to other departments in a meeting held in the disaster control headquarters. Also, even after the headquarters is disbanded, the department with primary responsibility should encourage stakeholder departments to set about making the necessary adjustments. (18)
- Depending on the situation, the timing of system strengthening for the secretariat in the headquarters should be brought forward, and the judgement criteria and division of duties for that should be clearly listed in the response manual for the headquarters. (19)

Procedure Consider rotating personnel

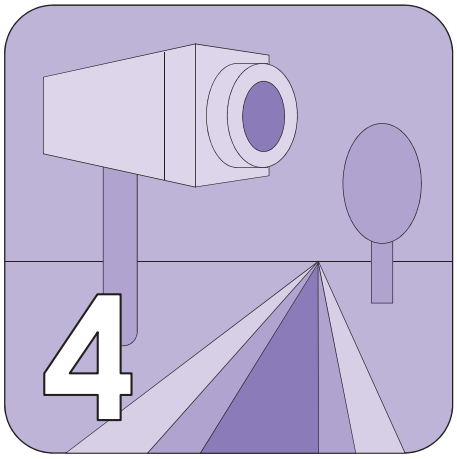
- If disaster response looks likely to drag on for some time, full consideration must be given to managing health, including psychological aspects, of personnel engaged in disaster response, and arrangements for substitute personnel must be made and their acquisition carried out, and measures taken to ensure that takeover protocols in substitutions are observed, such as the thorough making of records in job sheet, while reviews and rotations of deployed personnel must be made with the workload taken into consideration. (5)

Skill Improve risk awareness among personnel from normal times

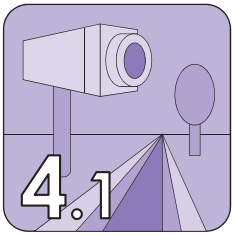
- Even during normal times, thorough efforts must be taken to be ready for disasters, and, as risk awareness to be carried out by personnel on their own, personnel notebooks and disaster manuals should be provided to make them aware of what they need to prepare for. (18)

Related guidelines

- Guide for municipality flood response
  (Disaster Management, Cabinet Office, Japan, July 2019)
- Guidelines for local public body support systems at times of disasters
  (Disaster Management, Cabinet Office, Japan, March 2017)



Collecting Info



It looks like the water level gauge is broken, what should I do?

~ Delay in gathering water level information due to breakdown in monitoring equipment ~

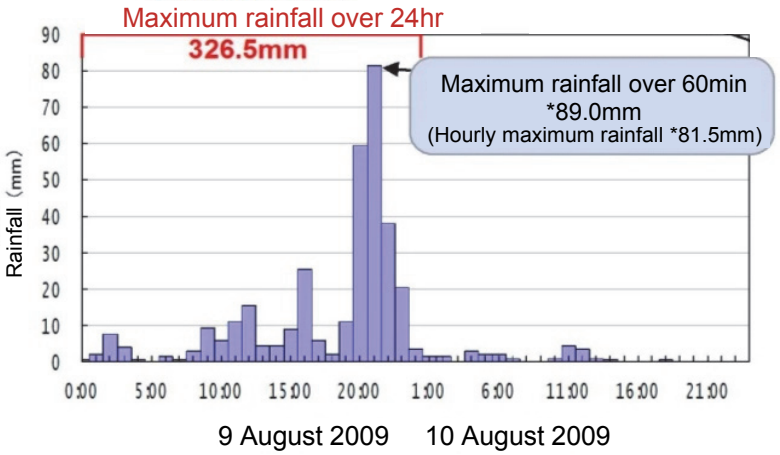
Case

- Local government Sayo, Hyogo pref.
- Disaster 2009 typhoon No. 9 disaster (Sayo-cho typhoon No. 9 disaster)
- Date 9 to 10 August 2009

Disaster Outline

Formed from a tropical low over the South Sea of Japan, typhoon No. 9 caused incredibly unstable weather in Hyogo prefecture at 21:00 on 9 August 2009, with rain falling at 89mm/hr in the Sayo area of Sayo-cho, recording a daily precipitation of 326.5mm. The death toll reached 18, plus two more people missing, while widespread flooding caused major damage, with more than 1,700 residences affected.
This disaster was due to the Sayogawa River bursting its banks, damaging nearby properties and flooding the 1st floor (ground floor) of the town hall, halting its function as a disaster prevention base. Furthermore, close to half of the victims of this disaster died while evacuating toward a shelter at nighttime after receiving an evacuation advisory message.

Sayo (Meteorological Agency) rainfall observation bureau



Rainfall over time at Sayo rain gauge station and water level at Sayo water level station

Critical Situations

Critical situation point

With the earliest flooding starting at Enkoji on the Sayogawa River and the Chikusagawa River in the Kuzaki area in September 2004's disaster, the greatest attention was paid to their water levels. The water level at Enkoji continued to rise, but water gauge data for the Chikusagawa River in Kuzaki held at 2.88m (below the overflow alert level) from 15:50 onward with no further rise seen.

Result Later, the broken gauge was discovered, but no-one realized the breakdown during the emergency.
The area's dedicated river monitoring & warning system (only for the Kuzaki section of Chikusagawa River and the Enkoji section of Sayogawa River) was used to find out when water levels became excessive, requiring an evacuation decision, which was made by government emergency radio to the residents of the areas concerned.

*Sources: After action review report on damage of typhoon No. 9 (5), p117, July 2010

Similar cases at other local government offices

- Unforeseeable issues piled up, such as sudden rise in river water levels and a broken water gauge. (9)

Countermeasure

Do not rely on just one piece of information, gather various pieces to grasp the situation.

Lessons to be learned

Facilities — Install more river monitoring cameras and water gauges

- It is a good idea to install more river monitoring cameras and water gauges. (5)
- Regarding areas where monitoring equipment, such as cameras and water gauges, is not installed, organize local residents to gather information using their own eyes – for instance, making use of the simple ruler-like markings on bridge footings that indicate water level. (5)

Facilities — Regularly maintain and inspect pieces of equipment

- The installation sites of all the types of monitoring equipment must be rechecked and the equipment regularly maintained and inspected to prevent gaps in water level and rainfall information data (needed for disaster response) due to breakdowns or other impediments during an emergency. (6)

Procedure — Gather observation information using various information instruments

- Gather information related to the current situations and forecasts for weather and water levels, making effective use of various information instruments and systems, such as river monitoring cameras, river water level forecasting systems and “river disaster prevention information” on the internet. (5)

Procedure — Systemize the gathering of information

- For the gathering and compiling of information, designate a supervisor(s) to prevent gaps and delays in the items gathered. (5)
- Concerning the gathering of information for areas, work to grasp onsite information by considering how to systemize efforts to understand situations in each area, including the selection of not only area units but also area personnel who are conversant with the local geography. (13)

Procedure — Create water level observation manual

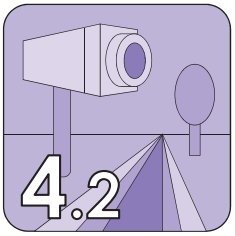
- Create a manual containing data such as procedures on operating instruments and pointers (what to do if a breakdown is suspected, etc.). (5)

Procedure — Make use of hotlines

- Even in normal times, fine tune the approach to hotlines, determining in advance the types of information to come into the headquarters, etc., to enable better use of hotlines connected to parties such as weather stations and river managers. (22)

Related guidelines

- Guide for municipality flood response
  (Disaster Management, Cabinet Office, Japan, July 2019)
- Guideline on how to make use of hotlines for small-to-medium-sized rivers (river environment section, Water and Disaster Management Bureau, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) , Japan, February 2017)



Who said the district's flooded? It's dark, how would I know!

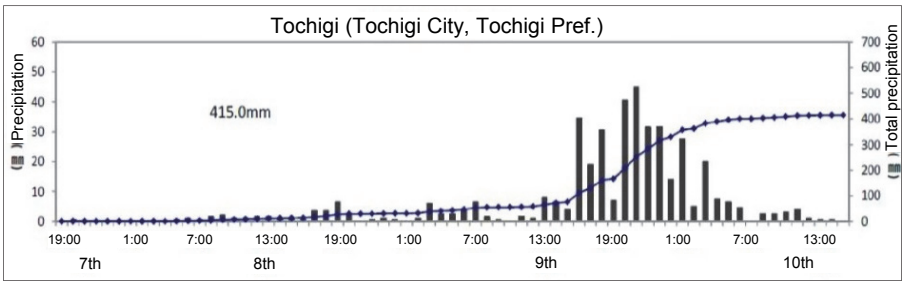
~ The difficulty of gathering damage information due to nighttime flooding, road cutoffs and community isolation ~

Case

- Local government: Tochigi, Tochigi pref.
- Disaster: September 2015 Kanto-Tohoku heavy rainfall (2015 Ibaraki flooding)
- Date: Afternoon of 9th to 11th of September 2015

Disaster Outline

From the 9th and all through the 10th of September 2015, heavy rain (daily rainfall of 299.0mm, hourly rate of 49.5mm) fell, causing Uzumagawa, Akazugawa and Naganokawa rivers to overflow and greatly damage various locations in the city. This disaster left a massive trail of destruction, including one person dead, more than 2,700 properties damaged, while landslides and overflow water cut off numerous roads and damaged rivers, and mudslides damaged agriculture by blocking wastewater channels and smothering fields.



Precipitation transition

Overflow from Uzumagawa River

*Sources: After action review report related to Kanto-Tohoku heavy rainfall in September 2015 (summary edition), Reflecting erudition from on verification results in future disaster prevention measures, March 2016

Critical Situations

Critical situation point: Even as the number of damaged locations increased, it was difficult to grasp information about damaged and flooded locations because the disaster was at night.

Critical situation point: The area around the local government building flooded, making it impossible to get vehicles out, so patrols could not be implemented.

Critical situation point: As areas that normally do not flood became flooded, there were not enough patrolling personnel members to prevent delays in orders for road closures.

▶ Result 1 It took time to find out the damage situation, so immediate aggregation of information was not possible.

*Sources: We will not forget! Support & restoration record for Kanto-Tohoku heavy rainfall disaster in September 2015 (25), p100 and p102, August 2016

Similar cases at other local government offices

- Concerning isolated mountainous areas, with power outages also having an impact, there was a temporary situation where information could not be obtained. (13)
- Patrol area was vast and roads were flooded, so the gathered information was insufficient. (5)
- There was a power outage at city hall and shelters, so phones were not working, which meant the gathering and transmission of information were insufficient. (1)

Countermeasure

Create a structure that enables not only the personnel but also presidents of neighborhood associations, flood fighting corps and others to find out and share onsite information.

Lessons to be learned

Procedure: Call on public to evacuate early

- When a typhoon, etc., looks like it will approach at nighttime, open up shelters during daylight hours, and call on the public to voluntarily evacuate to those shelters. (25)
- Improvement example: In Tochigi, Tochigi prefecture, shelters are opened early and calls made for voluntary evacuation, in order to prevent situations where people have to evacuate in stormy weather at night.

Procedure: Grasp the situation through collaborations with presidents of neighborhood associations and citizens

- Prepare a system that enables collaboration with presidents of neighborhood associations to swiftly grasp situations. (14)
- Make calls for damage information from citizens using the internet, etc., and aggregate that information. Get presidents of neighborhood associations to appoint disaster damage liaison officers for districts, so that they can provide damage information. (25)
- Improvement example: In Sayo, Hyogo prefecture, citizens who can see the water levels in rivers from their homes were asked to be monitors in a disaster monitoring system that only requires the monitors to check and notify about the water level when contacted.

Procedure: Grasp the situation known through collaborations with organizations

- Systemize cooperation and strengthen collaboration with organizations, such as the construction industry union. (25)

Facilities: Measures for isolated communities

- Ensure secure methods of mutual communication with communities that could become isolated. Also, work to stockpile emergency power generators. (11)
- Train citizens to be proficient in the use of communication equipment. (11)

Procedure: Prepare movement routes for times of emergency

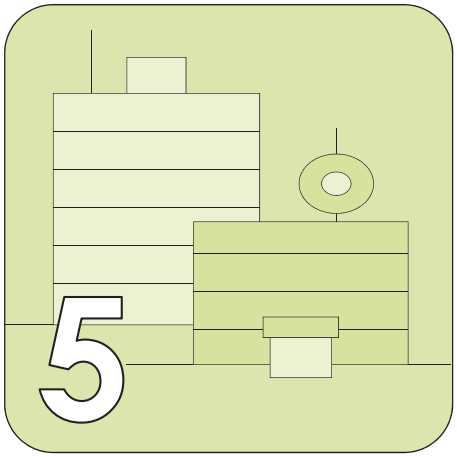
- Prepare in advance the movement routes to be used at times of emergency. Take into consideration the situation if flooding occurs, and review deployment locations for official vehicles. (25)

Procedure: Safety measures for nighttime patrols

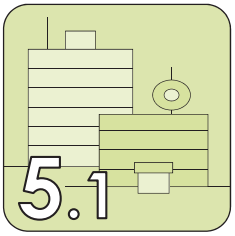
- If water levels rise at night, equip official vehicles with lighting equipment, such as floodlights. (25)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Disaster prevention & risk management self-check items (Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, Japan, March 2017)
  (In particular, Chapter 3-1: Gathering and analyzing monitoring and damage information)



Collaborating with Stakeholder Bodies

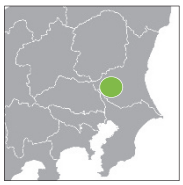


How should I pass on this info to stakeholder bodies?

~ Delays in response due to deficiencies in collaboration with stakeholder bodies (river office, weather station, fire department, etc.) ~

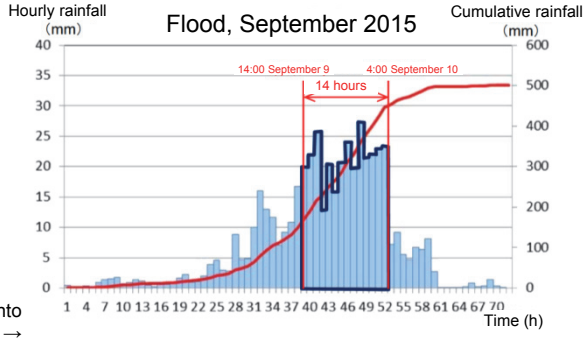
Case

- Local government: Joso, Ibaraki pref.
- Disaster: September 2015 Kanto-Tohoku heavy rainfall (2015 Kinugawa River Flooding, Joso)
- Date: Afternoon of 9th to 11th of September 2015



Disaster Outline

Early morning on the 10th, several parts of Kinugawa River began to overflow and banks to leak. By 12:50, one section of the bank collapsed at Missaka-cho in the city, causing massive damage, with widespread flooding in the area between Kinugawa and Kokaigawa rivers, two people died, 40 or more people were injured and 5,000 or more properties were partially or fully destroyed. The city hall, completed in 2014 and featuring the lessons learned from the Great East Japan Earthquake (2011), was inundated with flood water, some 4,300 citizens were rescued, with 1,339 people winched to safety by helicopters.



Rainfall change over time ("Kinugawa River flood damage and recovery circumstances", Kanto Regional Development Bureau) →

Critical Situations

Critical situation point

Disaster prevention unit, primarily tasked with the role of secretariat/staffing function for the disaster control headquarters, was overwhelmed by the surge in phone calls.

Result 1 The unit did not have time to grasp the activity status of each stakeholder body and then share that information.

Critical situation point

Information on a hotline directly linked to the mobile phone of the city mayor was not transmitted from the disaster control headquarters to the disaster prevention unit.

Result 2 The hotline information was not shared (not even with stakeholder departments), leading to the fire department headquarters finding out about the Kinugawa River bank bursting on TV and emergency government radio.

Critical situation point

It was not envisaged that liaison officers from stakeholder bodies should participate in meetings at the disaster control headquarters.

Result 3 It was not possible to share information with stakeholder bodies.

*Sources: After action review report on flooding of Kinugawa River, Joso in 2015 (23), p33-34, 13 June 2016

Similar cases at other local government offices

- Sharing information (about issues such as areas being issued with evacuation advisories and opening of shelters) between the disaster control headquarters and fire department headquarters and volunteer fire corps was not possible. (25)
- Information about the well-being of people checked by bodies, such as the city, fire department and prefecture, did not get shared; moreover, due to a lack of integration of items, checks on well-being of people were made numerous times to local residents and local leaders. (12)
- There was a hotline connected to the national government, but it did not function, so the latest weather information did not reach the personnel in the headquarters. (10)

Countermeasure

Use joint training to check the contents and timing of information to be passed on or received.

Lessons to be learned

Procedure: Clarify division of roles among stakeholder bodies

- Depending on the type of disaster, scale and area damaged, there are a variety of stakeholders (national government, prefectures, nearby local authorities, companies, volunteers, etc.) that can take action, so list up in detail the division of duties for stakeholders in the local disaster prevention plan, and make those division of duties thoroughly known to the stakeholders. (23)

Procedure: Develop “face-to-face relationships” with stakeholder bodies by holding information sharing meetings and/or running training programs, etc.

- From normal times, base collaboration on “face-to-face” relationships, so that cooperation can be requested and information can be shared speedily and accurately at times of disaster. (6)
- Get road operators, police and fire departments to patrol together and share information in a meeting held every year before the flood season, so that they can share information on how to more effectively develop facilities and inspections as well as check and strengthen their contact systems. (7)
- From normal times, request periodic participation from all stakeholder bodies in disaster imagination games and practical training, as it is necessary to check mutual roles and specific methods for sharing information. (23)

Procedure: Mutually dispatch liaison officers between stakeholder bodies

- During disaster response, liaison officers should be mutually dispatched between stakeholder bodies as an effective way of gathering information at each destination. (23)

Procedure: Clarify the confirmation method to be used when liaison officers of stakeholder bodies assemble.

- Clarify the confirmation method (body name, liaison officer name(s), number of people, etc.) to be used when liaison officers of stakeholder bodies assemble. (24)

Procedure: Use hotlines effectively

- Improvement example: In Hofu, Yamaguchi prefecture, hotlines for times of emergency have been established with the national government, prefecture, city mayor and disaster risk management chief.

Procedure: Standardize terminology pertaining to disaster response

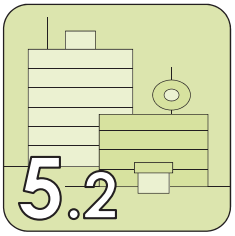
- Work to mutually deepen the understanding of response capabilities and work undertaken by disaster prevention bodies, and standardize the terminology used during emergencies. (2)

Pointers

- The 2017 amendment to the flood prevention law denotes the founding of a council system for reducing large-scale flooding, in order to develop a collaborative system for various stakeholders, such as local public bodies, river operators and flood prevention managers, as path toward making sure everyone escapes when a disaster hits.

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guideline on how to make use of hotlines for small-to-medium-sized rivers (river environment section, Water and Disaster Management Bureau, Ministry of Land, Infrastructure, Transport and Tourism (MLIT) , Japan, February 2017)

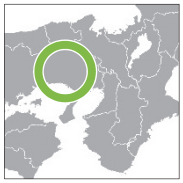


The press releases for the prefecture and city are carrying different details!

~ Insufficient sharing of information between prefectures and municipalities ~

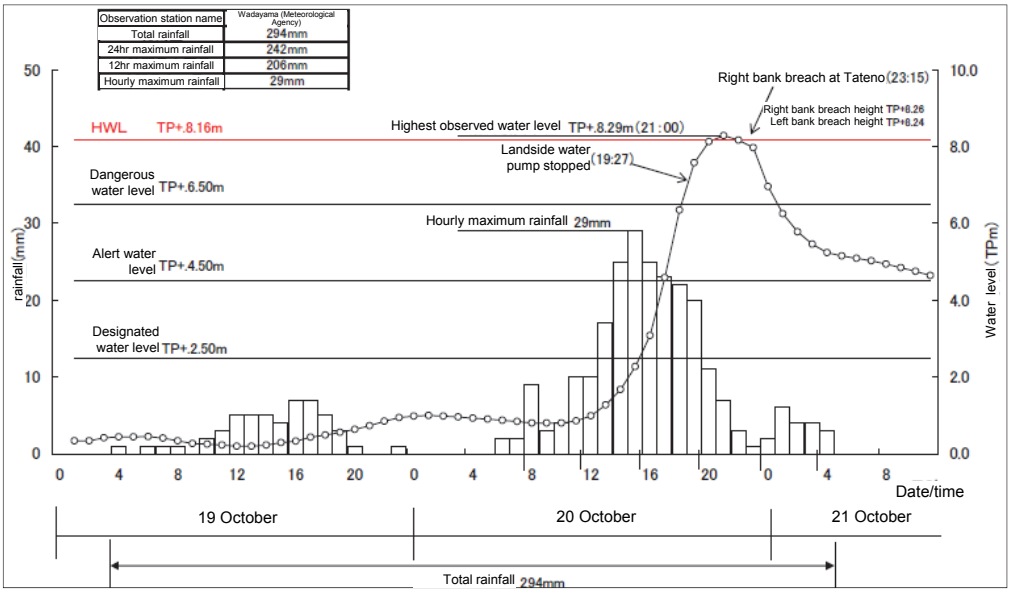
Case

- Local government: Hyogo pref.
- Disaster: Hyogo pref. typhoon No. 23 disaster (2004 typhoon No. 23 disaster)
- Date: Night of 19th to end of 20th of October 2004



Disaster Outline

Typhoon No. 23 brought massive devastation to mostly the Awaji and Tajima areas, with 26 deaths, 130 injured, some 7,500 properties partially or fully destroyed and some 11,000 properties inundated with water below or above the floor line, etc. Rainfall exceeded 300-350mm/24h in widespread parts of Awaji, with a concentrated downpour between 6:00 and 18:00 on the 20th. In Tajima, along the total length of the Maruyama River, rainfall exceeded 200mm/24h, with concentrated downpour between 8:00 and 22:00 on the 20th.



Rainfall and water level on Maruyama River (at Tatsuno) in Tajima

Critical Situations

Critical situation point

There were differences in the press releases from the prefecture and the municipalities.

Result: There were some discrepancies between figures given in announcements by the prefecture and municipalities.

*Sources: After action review report on damage of typhoon No. 23 (3), p36, December 2005

Similar cases at other local government offices

- Regarding the number of people not yet contacted (to confirm wellbeing) reported by the city, the prefecture, without sufficiently confirming/coordinating the content, publicly announced the city's figure as the figure for people missing, which led to a misunderstanding about who had not been contacted and who was missing. (24)
- Regarding a historical site damaged in the disaster, the city announced it as damage to cultural assets, while the prefecture did not announce it as such, exposing a discrepancy in the public announcements of the city and prefecture. (19)
- As municipalities were so busy responding to the disaster, they failed in some cases to answer phone calls from the prefecture providing warnings. (15)
- Due to lightning strike damage to prefecture's system, the message that the flood warning had been lifted did not reach the city, exposing a glitch in information sharing between prefecture and city. (14)

Countermeasure

Prefectures must make the effort to assertively go and get information without waiting for it come in from municipalities.

Lessons to be learned

Procedure: Dispatch prefectural personnel to municipalities

- Depending on the damage status, prefectural support personnel and/or headquarters personnel should be dispatched/stationed at the disaster control headquarters in municipalities to directly gather information from as near as possible to the disaster site(s), while also serving as the portal for coordinating other things, to strengthen the systems for gathering information and collaborating. (7)

  Improvement example: In Gifu prefecture, based on lessons learned, a decision has been made to dispatch liaison officers to disaster sites to grasp the needs pertaining to damage information in and support of damaged municipalities, with the liaison officers to be dispatched to each municipality already named.

Facilities: Strengthen the disaster prevention information network between prefecture and municipalities

- Validate operation of the terminals (PCs) in the disaster prevention information system, to bring the information infrastructure between prefecture and municipalities up to scratch. (6)
- Promote development of rules to encourage labor-saving information aggregation in prefectures. (4)

Skill: Improve personnel skills by holding workshops on disaster prevention information system

- Thoroughly implement workshops hosted by prefectures, including efforts to increase the number of workshops held, in order to increase the number of personnel who can operate terminals (PCs, etc.) running the disaster prevention information system in municipalities. (27)

Procedure: Decide who will be responsible for gathering/aggregating/transmitting information in municipalities

- Decide who will be responsible for gathering/aggregating/transmitting information, and deploy specialist personnel members to undertake those tasks (including the input of processed data into the damage information aggregation system) so that information can be provided swiftly and accurately for municipalities, especially important information (official evacuation advisories and roll call information). (7)

Procedure: Coordinate on contents to be announced

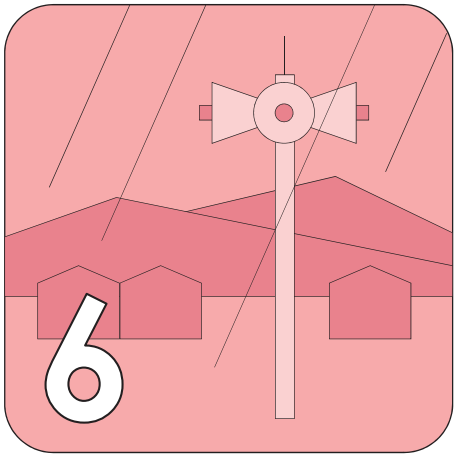
- Prefectures and municipalities must consider the timing of their press releases, carefully coordinating on contents, so as to avoid discrepancies in figures and other data announced. (3)

Procedure: Introduce rules for creation of damage reports

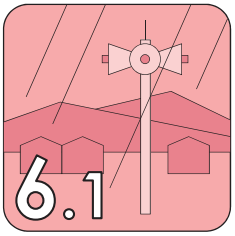
- Newly set standards for the typical creation cycle when creating a damage report. And, at times of disaster, show the report creation schedule based on those standards to the municipalities and fire department headquarters in advance. (27)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Disaster prevention & risk management self-check items (Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, Japan, March 2017)
  (In particular, Chapter 2-1: Installation and operation of disaster control headquarters)
- Toward strengthening the functions of municipal disaster control headquarters ~Case studies on disaster prevention information system~,
  (Civil Protection and Disaster Management Department, Fire and Disaster Management Agency, July 2017)



Issuing Evacuation Advisory, etc.



When do we issue the alert level 4 evacuation advisory?

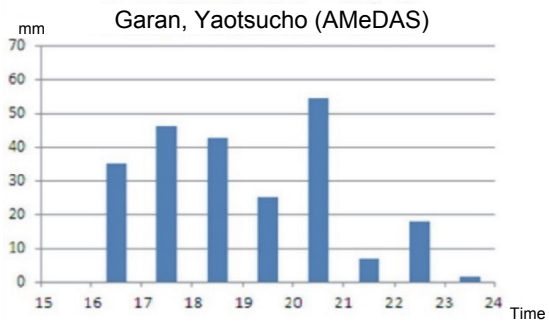
~ Delays in issuing evacuation advisories and orders due to a lack of specific decision-making criteria ~

Case

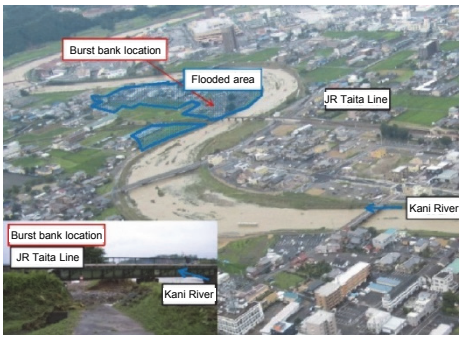
- Local government: Gifu pref.
- Disaster: 7.15 heavy rainfall (2010 heavy rainfall, Gifu pref.)
- Date: Just after noon of 15th to early hours of 16th of July 2010

Disaster Outline

Between 15 and 16 July 2010, localized torrential rain, brought on by a seasonal rain front, caused massive damage to various districts in the prefecture, including four deaths, two missing, one seriously injured, 15 properties partially or fully destroyed, 75 properties flooded above floor line and 380 properties flooded below floor line. From just after noon until very late at night on the 15th, extremely heavy localized rain fell at about 60mm/hr across the areas of Chuno and Tono, with rainfall analysis showing locations suffering in excess of 300mm of rainfall in areas from Yaotsucho to Mitakecho in the vicinity of Kani, where the Kanigawa River burst its banks and the Tsuchida area where overflow damage occurred both upstream and downstream of Tohashiri Bridge.



Automated Meteorological Data Acquisition System (AMeDAS) rainfall every hour in Garan, Yaotsucho



Widespread flooding in Kani

Critical Situations

Critical situation point

There were municipalities where the contents of the “criteria for officially announcing evacuation advisories” complicated the decision-making process for announcements.

Result 1 Some municipalities found it difficult to decide when to make announcements such as the evacuation advisory.

Critical situation point

As heavy rain fell in a short period of time at night, it was difficult for patrols, etc., to grasp the sudden rises in water levels and the predictive phenomena.

Result 2 It took time to grasp whether water levels were rising and whether there were predictive phenomena to aid judgement calls on official evacuation advisories.

*Sources: After action review report on damage from heavy rain on 7.15 (7), p32, 21 September 2010

Similar cases at other local government offices

- There were no predictive circumstances and indexes set as criteria for officially advising/ordering evacuation. Also, the “Joso flooding hazard map” was hardly made use of in deciding and executing evacuation response in areas impacted. (23)
- No specific judgement criteria for official announcement of evacuation information had been decided upon. (10)
- Objective decision-making criteria for officially announcing evacuation information needed to have been drawn up (in advance). (6)

Countermeasure

Referring also to existing manuals, create criteria for officially announcing evacuation information.

Lessons to be learned

Procedure Create or update criteria for judging when to officially announce alert level 4 evacuation advisory

- Any municipality that has yet to create judgement criteria for officially announcing evacuation advisories/orders (urgent), etc., should be guided to do so quickly, while municipalities that have drawn up such criteria should be requested to review the contents, so that criteria are thoroughly in place as provisions for communities that ought to evacuate. (6)

- Clarify criteria (rainfall, water level, etc.) in accordance with emergency faced to create a new manual that denotes the specific judgement criteria for announcing evacuation information. (10)

Procedure Establish a manual operation system

- Establish a system (timing of and system for conferencing to consider officially announcing evacuation advisory as well as who should participate in that decision-making, etc.) for securely operating the manual even during short, localized bursts of torrential rainfall. (7)

Procedure Review areas covered by alert level 4 evacuation advisories

- Listing the areas that ought to be evacuated in the manual should be based on the actual results of evacuation training and the consideration of areas to be officially issued with evacuation advisories based on reference to pertinent hazard maps to enable a more effective approach to evacuation advisories, etc., with all such considerations reflected in the manual. (7)

- To enhance effectiveness of evacuation advisories, the dangers that have to be present for evacuation must be accurately grasped, so as to narrow down the target areas to be considered for such official announcements. (7)

Procedure Review the timing (opportunity) for officially announcing alert level 4 evacuation advisory

- In considering evacuation advisories, do not be afraid of making an unnecessary call, and make sure to announce evacuation advisories as much as possible in advance of the danger bearing down on the communities concerned by taking into account the amount of time it will take to finish evacuation of citizens. (8)

Procedure Prepare gathering and processing system for disaster prevention information

- Obtaining information is indispensable to the making of official announcements on evacuation information, so for information coming into the disaster control headquarters set up a unit to gather and process information and a general affairs unit to analyze that information. (10)

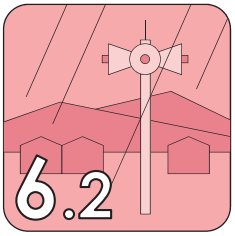
Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)

- Guidelines on evacuation advisory, etc. (2) (official announcement criteria/disaster prevention system edition, Disaster Management, Cabinet Office, Japan, March 2019)

- Guidelines on sediment disaster warning evacuation, Sediment control department, Ministry of Land, Infrastructure, Transport and Tourism (MLIT) , Japan, April 2015
(In particular, Chapter 5: Officially announcing/lifting evacuation advisories, etc.)

- Disaster prevention & risk management self-check items (Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, Japan, March 2017)
(In particular, Chapter 2-2: Drawing up of official announcement criteria for evacuation advisories, etc.)



Is it okay to put out an evacuation advisory (alert level 4) even though the shelters are not open yet?

~ Delay in opening shelters impacted official announcement of evacuation advisory ~

Case

- Local government: Hiroshima, Hiroshima pref.
- Disaster: 8.20 heavy rainfall (2014 mudslide, Hiroshima)
- Date: Early dawn to morning of 20 August 2014

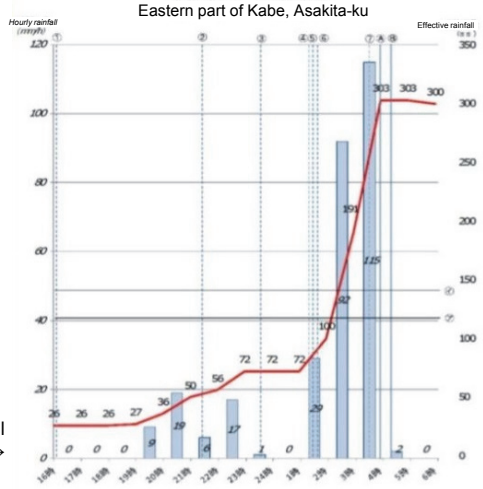
Disaster Outline

On 20 August 2014, two hours of unparalleled torrential rain in excess of 200mm between 2:00 and 4:00 in Hiroshima caused mudslides and landslides across widespread foothills and valleys, causing immense damage, including 77 deaths in Asaminami-ku and Asakita-ku (plus three deaths related to the disaster). The city authorities officially announced evacuation advisories at 4:15 in Asaminami-ku and 4:30 in Asakita-ku, both after large-scale landslides had occurred.

← Rain-damaged area

Hourly rainfall & effective rainfall (16:00 on 19th to 6:00 on 20th) →

Eastern part of Kabe, Asakita-ku



Critical Situations

Critical situation point

Official announcement of evacuation advisory and opening of shelters were carried out simultaneously irrespective of situation.

Critical situation point

The decision to implement evacuation advisories was made at 3:55, but then time was needed to contact shelter managers and autonomous disaster prevention group leaders as well as dispatch personnel to open shelters and find alternative facilities for unusable flooded shelters.

▶ Result Despite the pressing need, and even though the decision had been taken to implement evacuation advisories, the various preparations to open the shelters took time (evacuation advisories went out at 4:15 in Asaminami-ku and 4:30 in Asakita-ku).

*Sources: After action review report on evacuation measures for heavy rainfall on 20 August 2014 (22), p45, January 2015

Similar cases at other local government offices

- As a prerequisite to officially ordering evacuation, authorities were fixated on procedures requiring shelters to be opened and reception preparation checked, which delayed official evacuation orders and was a factor in hindering orders going out in one go to evacuate a widespread area. (23)
- When sounding a landslide alert information, time was needed to grasp areas, populations and number of households to be targeted by evacuation advisory, so the timely opportunity for announcing the evacuation advisory was lost. (20)

Countermeasure

Evacuation information is vital for making citizens aware of pressing danger, so follow the criteria to swiftly announce evacuation.

Lessons to be learned

Procedure — Announce alert level 4 evacuation advisories without waiting for shelters to be opened

- When officially announcing evacuation advisories, use the emergency broadcast system to make the announcement, without waiting for all the secondary shelters to be opened. (9)
- Improvement example: In Hiroshima, Hiroshima prefecture, during the 8.20 heavy rainfall disaster, official announcement of evacuation advisory and opening of shelters were carried out simultaneously irrespective of situation – so, after that, the local disaster prevention plan was revised to enable official evacuation announcements without hesitation or consideration for the time of day (nighttime, early morning) and/or whether designated emergency evacuation sites are open, when evacuation advisories/orders are deemed necessary (are urgently needed).

Skill — Foment a common understanding with residents

- It is extremely important that residents and municipalities have a common understanding from normal times about dangers in each local area (landslide and flooding dangers, etc.) and know where shelters are and the evacuation routes to be taken (including the safety measures to be taken when sheltering at home). (17)

Skill — Promote public understanding of information contents

- Strive to further inform residents of the types of evacuation information and make them aware of the increase in potential danger (loss of life) that is incumbent when an evacuation information is announced. (22)
- To ensure swift, appropriate behavior from residents at times of disaster, push to make them aware of the meanings of landslide alert information, record short-period downpour information and special alerts, etc. (17)

Procedure — Collaborate with local residents

- Collaborate with disaster prevention coordinators (commissioned by local village leaders and police department) to encourage local residents to autonomously evacuate at early opportunities. (11)
- For opening (unlocking) shelters, multiple people ought to be able to do the opening (even in autonomous disaster prevention groups). (22)

Procedure — Create and share database info on areas vulnerable to disaster and the number of residents

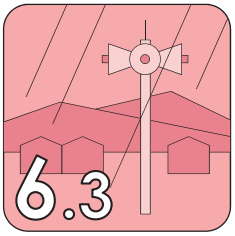
- Create a database of areas predictably prone to flooding, locations at risk of landslide, the number of households and the number of residents. (20)
- Also, list up these pieces of data in a manual used to decide upon/transmit evacuation advisories, etc., sharing the database across the entire local government office. (20)

Procedure — Implement training on making official announcements of evacuation information

- Disaster control headquarters' personnel should proactively participate in disaster prevention training, such as imagine games where the ideas is to imagine a disaster from local messages and the telltale signs, that will help them to quickly determine areas that should be issued with evacuation information (13)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guidelines on evacuation advisory, etc. (2) (official announcement criteria/disaster prevention system edition, Disaster Management, Cabinet Office, Japan, March 2019)
- "Guidelines on sediment disaster warning evacuation", Sediment control department, Ministry of Land, Infrastructure, Transport and Tourism (MLIT) , Japan, April 2015
  (In particular, Chapter 5: Officially announcing/lifting evacuation advisories, etc.)



We need to evacuate to a wider area outside of the city, but how!?

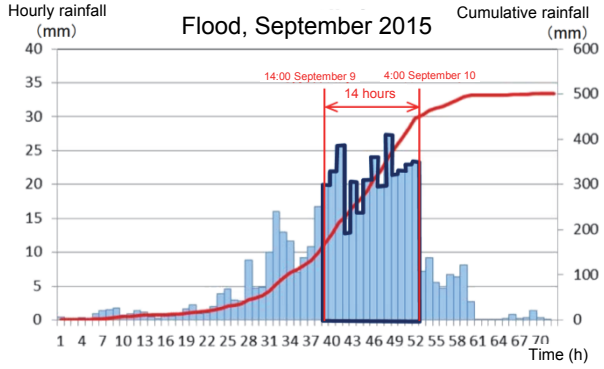
~ Lack of awareness about evacuating to wider area caused response delay ~

Case

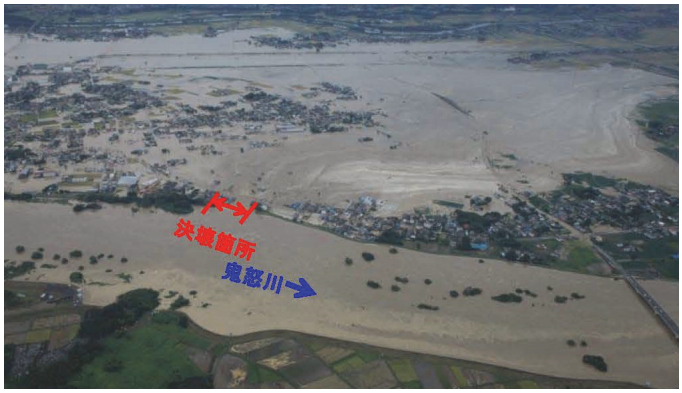
- Local government: Joso, Ibaraki pref.
- Disaster: September 2015 Kanto-Tohoku heavy rainfall (2015 Kinugawa River major flood, Joso)
- Date: Afternoon of 9th to 11th of September 2015

Disaster Outline

Early morning on the 10th, several parts of Kinugawa River began to overflow and banks to leak. By 12:50, one section of the bank collapsed at Missaka-cho in the city, causing massive damage, with widespread flooding in the area between Kinugawa and Kokaigawa rivers, two people died, 40 or more people were injured and 5,000 or more properties partially or fully destroyed. The city hall, completed in 2014 and featuring the lessons learned from the Great East Japan Earthquake (2011), was inundated with flood water, some 4,300 citizens were rescued, with 1,339 people winched to safety by helicopters.



Rainfall change over time ("Kinugawa River flood damage and recovery circumstances", Kanto Regional Development Bureau)



River overflow

Critical Situations

Critical situation point

Inadvertently, getting everyone evacuated in the city became the priority, with efforts to evacuate to wider areas left for later.

Critical situation point

After the Kinugawa River burst at Missaka-cho, citizens on the east side of Kinugawa were ordered to evacuate to the west side, but, at that time, the disaster control headquarters omitted from the outset the option of evacuating to areas outside of the city.

Result 1 Regarding the contents of this evacuation order, after it was made, the propriety of the decision drew controversy because it was realized that crossing the river from the east would be dangerous for citizens, and predictably bridges would become jammed with evacuation traffic, further increasing dangers.

Result 2 Actually, many residents opted to head to shelters in other municipalities beyond the boundaries of the city, and Joso city authorities ended up following in the wake of that smart proactive action by residents to get people to evacuate outside of the city.

*Sources: After action review report on flooding of Kinugawa River, Joso in 2015 (23), p45,13 June 2016

Similar cases at other local government offices

- Municipalities are not set up to evacuate across wider areas, so among municipalities there was insufficient understanding of the range of support available for wider area evacuation or the costs involved. (24)
- It was difficult to evacuate expansively because the damage status of destination municipalities was unknown. (24)

Countermeasure

Collaborate with adjacent municipalities to also ensure safe evacuation destinations outside of your own municipalities.

Lessons to be learned

Procedure: Develop a mutual support system with nearby municipalities

- Cooperation with the prefecture and nearby local governments ought to be sought to develop a mutual support system for wider area evacuation during flooding and earthquakes. (23)
- Although the words “wider area” are being used here, they represent the meaning of a evacuation to the nearest safe place for evacuees. In that process, a distinction between evacuation and sheltering is made, which is best thought of as, first, giving priority to the development of an evacuation cooperation system, whereas, at the shelter-operating stage for sheltering, shelterers will be asked at some point to move to shelters in their residential areas. (23)

Procedure: Enter into disaster agreements with adjacent municipalities

- Enter into disaster agreements with adjacent municipalities, to enable use of shelters in other municipalities. (25)
- Improvement example: In Tochigi, Tochigi prefecture, disaster agreements have been entered into with adjacent municipalities, enabling the mutual use of shelters.

Procedure: Give specific consideration to wider area evacuation

- Municipalities should consider shelter facilities for wider area evacuation within the existing agreements they have with adjacent municipalities. (24)

Procedure: Officially announcing alert level 4 evacuation advisory which takes into account wider area evacuation

- When calling for wider area evacuation, municipalities should take into account the time required to evacuate, announcing evacuation advisories early. (24)

Pointers

- The 2017 amendment to the flood prevention law denotes the founding of a council system for reducing large-scale flooding, in order to develop a collaborative system for various stakeholders, such as local public bodies, river operators and flood prevention managers, as a path toward making sure everyone escapes when a disaster hits.
- Also, the Central Disaster Prevention Council’s working group for considering large-scale, wider area evacuation from flooding and high-tide overflows shows the way of thinking needed to consider wider area evacuation, with the basic approach to large-scale, wider area evacuation from flooding and high-tide overflow and a method for quantitative calculations as well as specific considerations for Koto-5-Ku (the five eastern wards of Tokyo).

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- The basic approach to large-scale, wider area evacuation from flooding and high-tide overflow and a method for quantitative calculations as well as specific considerations for the five eastern wards of Tokyo (summary version/detailed version), March 2018, Central Disaster Prevention Council’s working group for considering large-scale, wider area evacuation from flooding and high-tide overflows
- Guideline on designating designated evacuation shelters, March 2017, Disaster Management, Cabinet Office
(In particular, Chapter 5(2): Designations beyond municipality areas, etc.)

Disseminating Info

We put out the info, but it doesn't seem to have gotten through to the public!

~ Information not reaching public because of message contents and insufficient transmission methods ~

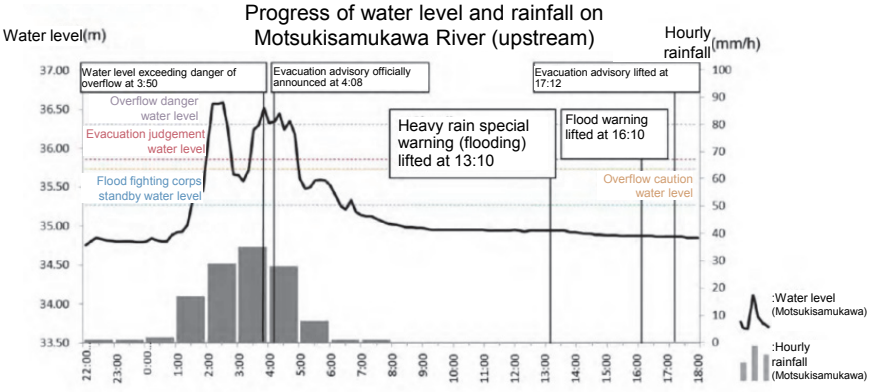
Case

- Local government: Sapporo, Hokkaido
- Disaster: Sapporo 9.11 heavy rainfall (2014 Sapporo heavy rainfall)
- Date: Night of 10th to end of 11th of September 2014

Disaster Outline

With rain falling continuously from before daybreak on 11 September, the Sapporo authorities declared a heavy rain special warning (flooding, landslides), firstly within Hokkaido. To implement this, the Sapporo disaster control headquarters and disaster control headquarters for each ward were set up, with evacuation advisories announced and shelters opened to ensure the safety of citizens. On this occasion, the 24-hour rainfall exceeded 200mm, a record-breaking downpour. There was no risk to life, but physical damage reached 187 cases across the city, with damage including flooding of properties (below and above floor line), landslides and river overflows.

Progress of water level and rainfall on Motsukisamukawa River (upstream)



Water level and rainfall progress on Motsukisamukawa River (upstream) between 22:00 on 10/9 and 18:00 11/9

Critical Situations

Critical situation point

Information provided on homepages was used appropriately, but supervising personnel did not manage to assemble straightaway, so it took some time before information started to be provided, and there was a spell of time when there was an overload of users trying to access the landslide hazard map, which made viewing difficult.

Critical situation point

Some wards did not have systems for public broadcasts – for example, there were no vehicles available for mobile broadcasting,.

▶ Result 2 Apart from emergency newsflash emails, the city lacked ways of informing citizens; thus, people whose mobile phones could not receive the emergency newsflash email, people who do not own mobile phones and people who do not normally use email did not realize that evacuation advisories had been announced.

*Sources: After action review report on response to heavy rainfall in Sapporo on 9.11(26), p13, March 2015

Similar cases at other local government offices

- Some homepage sites were difficult to connect to. (27)
- In some cases, door-to-door visits by village heads or volunteer fire corps were not possible because of flooded roads and other dangers that made going outside risky. Also, there was some cases where area email was not used in a timely manner to effectively warn people because everyone was in such a rush to respond to the disaster. (15)
- There were difficulties in checking river information provided on the internet because some citizens (the elderly, etc.) who do not own computers or mobile phones could not access the internet. (6)

Countermeasure

Use multiple methods to transmit information.
Citizens must also make the effort to go and collect information.

Lessons to be learned

Procedure: Use various ways to transmit and inform people about disaster and evacuation

- While it is important to have multiple transmission methods, such as audio transmissions (outdoor loudspeakers, local FM radio, city/volunteer fire corps broadcasting vehicles, etc.) and written transmissions (municipality disaster prevention emails, mobile phone mail messages, homepages, SNS, TV terrestrial digital broadcasting, etc.), the public needs to know in advance about those methods and make a concerted effort to gather information. (18)
- Public awareness through publicity needs to be implemented thoroughly to inform people about the methods of information transmission used. (18)

Procedure: Improve functions of homepages

- To cope with the extra alerts and access demand, new functions should be introduced to enable a switchover to data-light homepage versions, where top pages focus on disaster information in text-centric formats at times of disaster. (27)
- To improve access, the capacities of communication lines for pertinent websites should be increased. (27)

Procedure: Review notations for areas targeted for alert level 4 evacuation advisories

- To make things easy to understand for the public, write down each district targeted by evacuation advisory, showing detailed addresses on TV and homepages, as well as inducing the public to act via emergency newsflash emails. (26)

Procedure: Transmit information to visitors, such as travelers and tourists

- Evacuation information must be shared swiftly and accurately with not just local citizens but with visitors (out-of-town drivers and tourists, etc.) via radio broadcasts and emergency newsflash emails, etc. (6)

Skill: Train personnel to be proficient in information transmission methods

- As some municipalities seem to be unable to put out or are slow at putting out emergency newsflash emails from computers, personnel members must become proficient at sending out messages, such as emergency newsflash emails. (15)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guideline (1) related to evacuation advisories (evacuation behavior/information transmission edition), (Disaster Management, Cabinet Office, Japan, March 2019)
  (In particular, Chapter 3: What information provision ought to be from the perspective of people receiving an evacuation advisory, etc.)
- Guidelines on evacuation advisory, etc. (2) (official announcement criteria/disaster prevention system edition, Disaster Management, Cabinet Office, Japan, March 2019)
- Guidelines on sediment disaster warning evacuation, Sediment control department, Ministry of Land, Infrastructure, Transport and Tourism (MLIT) , Japan, April 2015
  (In particular, Chapter 4: transmission of information, etc.)
- Disaster prevention & risk management self-check items (Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, Japan, March 2017)
  (In particular, Chapter 2-3: Methods of transmitting evacuation advisories, etc.)

I can't make out the message from government emergency radio!

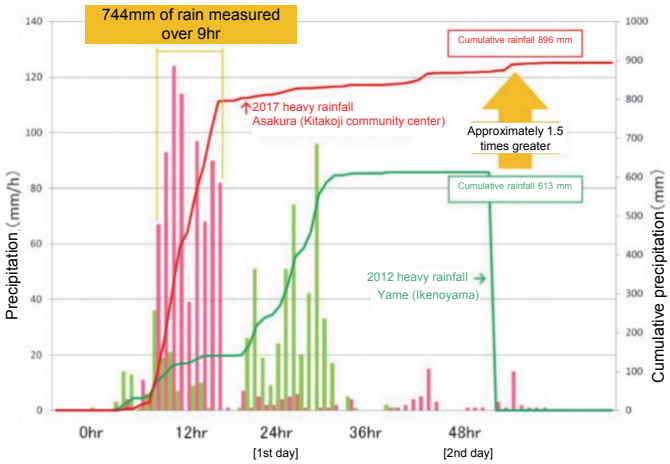
~ Information broadcasts missed due to power outages, overflows and/or poor audio from the government emergency radio ~

Case

- Local government: Fukuoka pref.
- Disaster: July 2017 northern Kyushu heavy rainfall
- Date: 5 to 7 July 2017

Disaster Outline

From 5th to 6th of July 2017, a rainy season front hovering over Tsushima Channel drew in warm and extremely moist air, forming a linear precipitation front that produced record downpours in Fukuoka and Oita prefectures. At 17:51 on the 5th, the Meteorological Agency announced for the first time in Kyushu a heavy rain special warning for Fukuoka prefecture. The human cost of this downpour was 39 dead or missing, while physical damage amounted to more than 1,000 properties partially or fully destroyed and more than 600 properties flooded below or above floor line.



Change of rainfall over time

Landslide damage (photo by ICHARM)

Critical Situations

Critical situation point

Besides some outdoor speakers for government emergency radio not functioning because of power outages and overflows, there were some cases of people not being able make out what was being said from outdoor speakers.

▶ Result Disaster prevention information was not securely transmitted to the public.

*Sources: After action review report on response to damage from heavy rainfall in northern part of Kyushu in July 2017 (28), p25, March 2018

Similar cases at other local government offices

- Many citizens affected by the disaster were unable to make sense of government emergency radio broadcasts although they could tell that a broadcast was being made. Also, some of the government emergency radio speakers' peripheral devices became submerged because of flooding, causing them to stop functioning. (23)
- Due to aging of equipment for government emergency radio, and difficulty in increasing equipment, etc., there are many areas where radio broadcasts cannot be heard clearly. (12)
- Some people could not hear the siren sounding due to downpour noise, while others did not know what the siren sounding meant. (6)

Countermeasure

Express a sense of danger using sirens and alike, as doing so will also encourage people to look for the details.

Lessons to be learned

Procedure: Consider how to multiply and diversify the ways of disseminating information

- Establish a Procedure for multiple methods of transmitting information, including government emergency radio, bosai-mail (emergency newsflash email), internet homepages, etc., and public address vehicles. (23)
- Also consider introducing indoor notification equipment, such as home receivers for government emergency radio and actual portable emergency radios. In addition, make use of free-dial calling services, email distribution, fax distribution and phone voice messaging services. (12)

Procedure: Make use of new warning sounds

- Consider warning sounds that could be used solely to urge evacuation in a straightforward way that anyone can understand, such as siren or alarm bell that raises the alarm of danger due to rising water level. The public must be made fully aware of the warning sound to be used. (6)

Procedure: Make sure all areas are provided with information

- Make sure that all areas are provided with information (no community should be left without info) by checking out the situation for providing information, and, if necessary, contriving ways to transmit different types of information. (6)

Procedure: Systemize cooperation with areas

- To swiftly and accurately transmit hazard information to the public about storms and flooding, the local residents and local government must unite in efforts from normal times to regularly undertake evacuation training and imagination games that envisage wind and water damage, etc. (6)

Facilities: Make effective use of images and video footage

- To provide hazard information swiftly and accurately to help local residents to judge whether evacuation is necessary themselves, web cameras and alike must be used to show the status of rivers on the internet and/or TV, etc. (6)
- Improvement example: In Hyogo prefecture, river monitoring cameras (19 cameras on 14 rivers) are used to provide visual information to the NHK Kobe broadcasting station, with footage being used in real time on news and data broadcasts. Moreover, Hyogo uses river monitoring cameras (134 cameras on 95 rivers) to provide footage on the internet. Also, since June 2018, the Yahoo weather and emergency website has been providing river monitoring camera footage.

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guideline (1) related to evacuation advisories (evacuation behavior/information transmission edition), (Disaster Management, Cabinet Office, Japan, March 2019)
  (In particular, Chapter 3: What information provision ought to be from the perspective of people receiving an evacuation advisory, etc.)
- Guidelines on evacuation advisory, etc. (2) (official announcement criteria/disaster prevention system edition, Disaster Management, Cabinet Office, Japan, March 2019)
- Guidelines on sediment disaster warning evacuation, Sediment control department, Ministry of Land, Infrastructure, Transport and Tourism (MLIT) , Japan, April 2015
  (In particular, Chapter 4: transmission of information, etc.)
- Disaster prevention & risk management self-check items (Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, Japan,March 2017)
  (In particular, Chapter 2-3: Methods of transmitting evacuation advisories, etc.)

Is this information getting to facilities for people requiring attention?

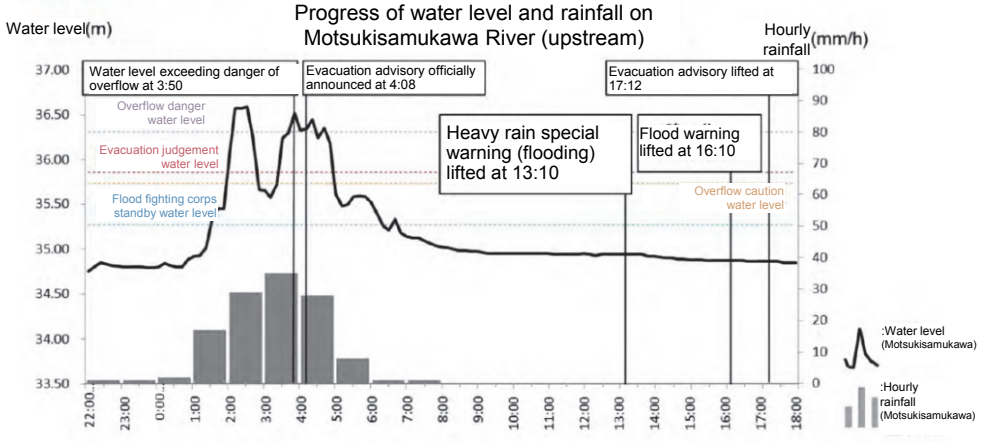
~ Delay in evacuation due to facilities for people requiring attention not being informed ~

Case

- Local government: Sapporo, Hokkaido
- Disaster: Sapporo 9.11 heavy rainfall (2014 Sapporo heavy rainfall)
- Date: Night of 10th to end of 11th of September 2014

Disaster Outline

With rain falling continuously from before daybreak on 11 September, the Sapporo authorities declared a heavy rain special warning (flooding, landslides), firstly within Hokkaido. To implement this, the Sapporo disaster control headquarters and disaster control headquarters for each ward were set up, with evacuation advisories announced and shelters opened to ensure the safety of citizens. On this occasion, the 24-hour rainfall exceeded 200mm, a record-breaking downpour. There was no risk to life, but physical damage reached 187 cases across the city, with damage including flooding of properties (below and above floor line), landslides and river overflows.



Water level and rainfall progress on Motsukisamugawa River (upstream) between 22:00 on 10/9 and 18:00 11/9

Damage caused→

Critical Situations

Critical situation point

Passing on hazard information to facilities for people requiring attention was forgotten because of confusion at the time.

Result Information did not get transmitted to facilities such as those for people requiring attention.

*Sources: After action review report on response to heavy rainfall in Sapporo on 9.11(26), p13, March 2015

Similar cases at other local government offices

- Regarding the provision of information to social welfare facilities located in areas assumed to be at risk from landslides and flooding, there were many municipalities that did not provide information because they judged that there was no damage. (17)
- As the local government was in the midst of securely grasping information about areas at risk and other information, landslide warning information was not provided to people who needed to know in facilities. (10)

Countermeasure

Make people thoroughly aware at the announcement stage of alert level 3 for evacuation preparations/begin evacuation of the elderly.

Lessons to be learned

Structure: Improve the system for disseminating information to facilities for people requiring attention

- Review how information is transmitted to facilities for people requiring attention, and create a structure that enables early-stage ongoing transmissions of information about weather and updates on disaster situations in nearby areas, etc. (10)
- Also consider making such information available by fax and the disaster information distribution system. (26)

Procedure: Produce training program and a manual for facilities for people requiring attention

- Training program and manual on predicted storm and flooding issues connected to facilities for people requiring attention must be produced. (11)

Procedure: Expand the methods used to provide information to people requiring attention

- Start audio and fax distribution service to provide evacuation information to strengthen the functions of the multi-media distribution system targeting people requiring attention at times of disaster who do not own a mobile phone and live alone. (19)
- Local communities, starting with autonomous disaster prevention associations and social welfare councils, should strengthen the system used to contact people requiring attention during disasters. (19)

Pointers

- The 2017 amendment to the flood prevention law denotes that the managers of facilities for people requiring attention located in areas assumed to be vulnerable to flooding and/or landslides are obliged to produce plans to ensure evacuation as well as conduct evacuation training. The definition of a facility for people requiring attention includes social welfare facilities, schools, medical facilities and any other facility used by people who require attention at times of disaster.
- When producing or altering plans to ensure evacuation, facility managers must inform municipality leaders about plans without delay.

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guideline (1) related to evacuation advisories (evacuation behavior/information transmission edition), (Disaster Management, Cabinet Office, Japan, March 2019)
  (In particular, Chapter 3: What information provision ought to be from the perspective of people receiving an evacuation advisory, Chapter 5: Ensure effectiveness of evacuation of people requiring attention, etc.)
- Guideline (flooding/run-off/high tide edition) on production of plan ensuring evacuation pertaining to facilities for people requiring attention (excluding medical facilities, etc.), Flood Risk Reduction Policy Planning Office, River Environment Division, Water and Disaster Management Bureau, Ministry of Land, Infrastructure, Transport and Tourism (MLIT) , Japan, June 2017
- Evacuation plan inspection manual for facilities for people requiring attention in relation to flooding and landslide disasters, MHLW and MLIT, June 2017
- Disaster prevention & risk management self-check items (Fire and Disaster Management Agency, Ministry o Internal Affairs and Communications, Japan, March 2017)
  (In particular, Chapter 2-5: Evacuation of people requiring attention and their carers, etc.)

I wonder if foreigners will be able to understand this information?

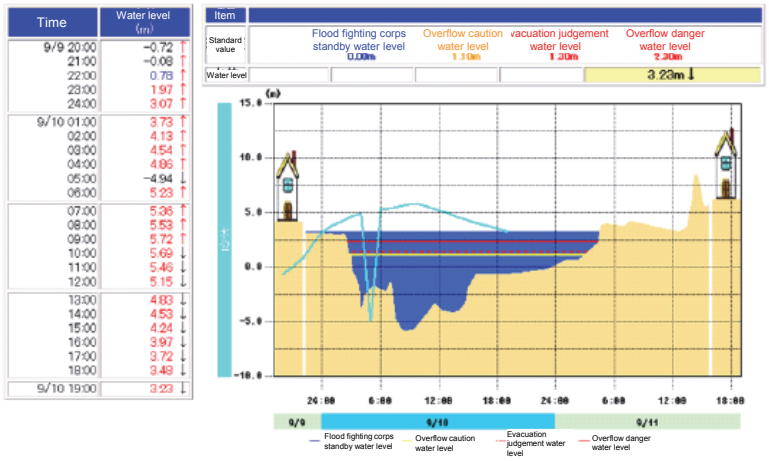
~ Delay in providing information to foreigners ~

Case

- Local government: Ibaraki pref.
- Disaster: September 2015 Kanto-Tohoku heavy rainfall (2015 Ibaraki flooding)
- Date: Afternoon of 9th to afternoon of 10th of September 2015

Disaster Outline

According to the Meteorological Agency, the impact of moist air coming in from the south due to typhoon No. 18 (and when it changed to a low pressure front) caused heavy rainfall across a widespread area from west to north Japan – in particular, bringing record rainfalls to the Kanto and Tohoku regions. In Ibaraki prefecture, a special heavy rain warning was announced at 7:45 on the 10th. The water level of Kinugawa River rose on the 10th, overflowing in the Wakamiyado area of Joso and then bursting its bank at Misaka in Joso, leading to widespread flooding in Joso. According to Ibaraki prefecture's summary of the damage in the prefecture, there were 5,000 or more properties partially or fully destroyed.



Changing water level at Kawashima water level monitoring station (river disaster prevention information homepage, MLIT)

Critical Situations

Critical situation point

Amidst the responses being made by the headquarters and local headquarters, the need emerged for personnel to be secured to transmit emergency information in multiple languages and to deal with foreign residents.

Result 1 It was a troublesome task to secure the personnel who could transmit the information and deal with the needs of foreigners.

Critical situation point

There were only a few linguist volunteers for lesser-known languages.

Result 2 There were limits to what kind of information could be provided in multiple languages.

*Sources: After action review report on response to Kanto-Tohoku heavy rainfall in September 2015(24), p10, 2016

Similar cases at other local government offices

- Foreigners could not understand the situation because homepage information was only in Japanese. (20)
- Regarding the transmission of information to foreigners, based on broadcasting agreements, requests to broadcasting bodies were insufficient. (19)

Countermeasure

Collaborate with international communication associations, etc., to systemize multi-lingual transmissions of information.

Lessons to be learned

Procedure Collaborate with stakeholder bodies and promote transmission of information to foreigners

- Consider how to transmit information in multiple languages at times of emergency by collaborating across widespread areas at times of disaster, such as working with international communication associations in your prefecture and/or municipality to secure linguist volunteers at times of disaster. (24)
- Securely collaborate with bodies such as local FM radio stations to transmit disaster information in multiple languages. (19)

Procedure Promote method for providing multi-lingual information

- Strive to get more foreigners to participate on Facebook pages run for international students and/or to sign up for mail magazines from international communication associations. (19)
- Introduce a multi-lingual machine translation system to homepages. (20)

Procedure Produce educational material, such as a handbook, for foreigners

- Tackle disaster prevention measures across a broad perspective of issues, including the producing of disaster prevention handbooks for foreigners. (18)

Pointers

- The comprehensive policy on accepting and coexisting with foreign human resources (decided by Cabinet on 25 December 2018) advocates the promotion of specific measures to create easy access to disaster prevention and weather information deemed necessary for foreigners (living in Japan).

Related guidelines

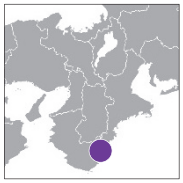
- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guideline (1) related to evacuation advisories (evacuation behavior/information transmission edition), (Disaster Management, Cabinet Office, Japan, March 2019)
  (In particular, Chapter 3: What information provision ought to be from the perspective of people receiving an evacuation advisory, etc.)
- Guidelines on transmission of disaster information and evacuation guidance in facilities used by foreigner visitors and the disabled, etc., working group for methods of evacuation guidance in facilities used by foreign visitors, Fire and Disaster Management Agency, MIC, March 2018
- Guideline for ensuring safety of foreign travelers visiting Japan (Guiding principles for listing responses to foreigner travelers visiting Japan), Japan Tourism Agency, Ministry of Land, Infrastructure, Transport and Tourism (MLIT) , Japan, October 2014
- Guideline for drawing up manual for initial response at times of disaster to foreign travelers visiting Japan (for everyone involved in tourism and accommodation facilities), Japan Tourism Agency, MLIT, October 2014
- Emergency information app: Safety tips, Japan Tourism Agency, MLIT, 2018 update

We can't get anything done with the media blitz out in the corridor!

~ Confusion due to inconsistent rules on providing information to the press ~

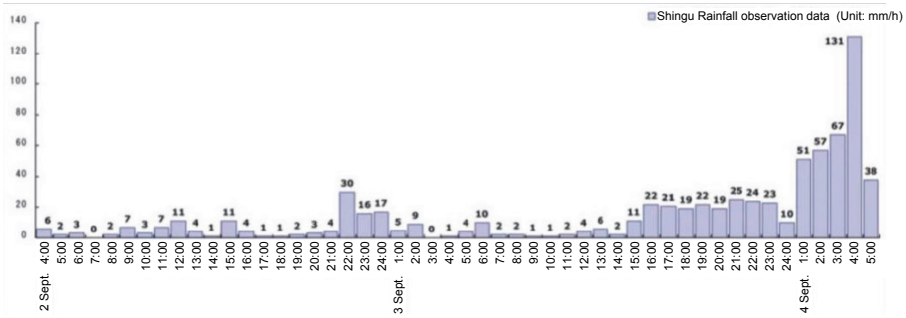
Case

- Local government: Shingu, Wakayama pref.
- Disaster: Kii Peninsula flooding (2011 Shingu heavy rainfall)
- Date: Before daybreak on 2nd to night of 4th of September 2011



Disaster Outline

Rain brought about by typhoon No. 12 fell for three days from 2 to 4 September. Before daybreak on the 4th, a record rainfall exceeding 100mm/hr was falling across nearly all areas of the city. Landslides, flooding and burst river banks led to human damage, including the deaths of 13 people, and one missing, while property damage extended to 2,964 properties, including 81 properties destroyed or washed away. There were power outages, suspensions of water supply and communication disruptions in all areas, all of which seriously impacted lifeline resources. Coupled with Kumanogawa River and city-managed rivers bursting their banks as well as the limits of inner drainage facilities (draining behind levees) being exceeded, causing riverbed scouring and bank protection collapses, etc., roads, starting with national route 168, were destroyed, enveloped in mudslides, exposed to slope failures and collapse of road shoulders (verges), leaving local citizens isolated in many places.



Precipitation data from Shingu weather station

Flood water surging over Kumano-ohashi Bridge

Critical Situations

Critical situation point

Various media companies (journalists) reported from each of the disaster sites (including phone interviews) because the city's information provision system had not been established.

▶ Result 1 While it is important to provide information to news outlets, a burden was placed on onsite personnel.

Critical situation point

There were no specific regulating of entrance to restricted areas set for news outlets, even though personal information was being frequently handled over the phone on written down on memos.

▶ Result 2 There were lingering issues of security, such as the risk of information leaking.

*Sources: After action review report on response to damage from 2011 typhoon No. 12 (12), p31, October 2012

Similar cases at other local government offices

- There was no clear response for news outlets. (26)
- The press officer was unable to assemble journalists directly after the announcement of the evacuation advisory, which meant that it took time for news outlets to respond sufficiently to that news. (26)
- As a press officer was not appointed in the disaster control headquarters, media reporters were asking questions everywhere, which hindered disaster relief work. (10)
- We were unable to respond to media outlets sufficiently because there is no press unit during normal times; moreover, personnel members are not used to talking to journalists as there is no need during normal times. (5)

Countermeasure

Hold periodic press releases but do not allow individual interviews.

Lessons to be learned

Procedure Provide information that media outlets can make use of

- Media outlets, such as TV, radio and newspapers, provide effective ways of spreading information to the public; so, when making press releases about a disaster situation, be sure to enthusiastically add any issues that your municipality would like to get across to the public, and ask for cooperation from all media outlets in releasing such information. (12)

Procedure Appoint a press officer

- To provide information to media outlets, integrate all efforts into your communications section, and periodically hold press releases. (12)

Procedure Periodically hold news conferences

- Establish a zone specifically for media outlets and at the same time form a communications unit to deal with media outlets. Periodically hold news conferences to transmit information to the public, making sure that your media response does not pose a hinderance to disaster response work. (10)

- In principle, do not allow disaster site interviews – instead, provide joint news conferences one to two times a day (with chief of communications section or, if necessary, the chief of the disaster control headquarters conducting them). (12)

Procedure Restrict areas where media outlets can enter

- During a disaster, getting to the disaster site(s) is a priority, and government workplaces will only have a skeleton staff – so, from the perspective of private information and security as well, designate the areas that are off limits to all but authorized personnel. (12)

Procedure Compile media materials

- The communications unit should gather information at all times from the disaster prevention department and create media materials from it to help in making press releases to media outlets. (13)

- List up frequently asked question, and consider ways of providing information, such as releases (of answers to listed questions). (13)

Procedure Produce a communications plan and a manual, and implement training

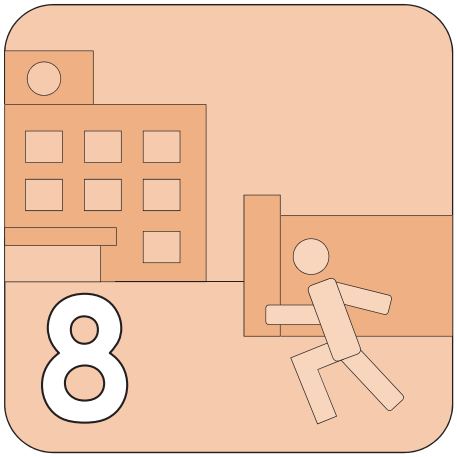
- Regarding news releases during a disaster, turn specific contents into a manual that can be used in response to the press. (13)

- For training in the disaster control headquarters, implement training for response to media outlets, such as holding mock news conferences. (10)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)

- Disaster prevention & risk management self-check items (Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, Japan, March 2017)
  (In particular, Chapter 2-1: Installation and operation of disaster control headquarters)



Shelters

(Designated emergency evacuation shelters and sites, etc.)

Might this shelter flood too?

～Shelter unusable due to flooding, etc.～

Case

- Local government: Kumamoto pref.
- Disaster: July 2012 north Kyushu heavy rainfall (widespread flooding in Kumamoto)
- Date: Before daybreak to noon on 12th of July 2012

Disaster Outline

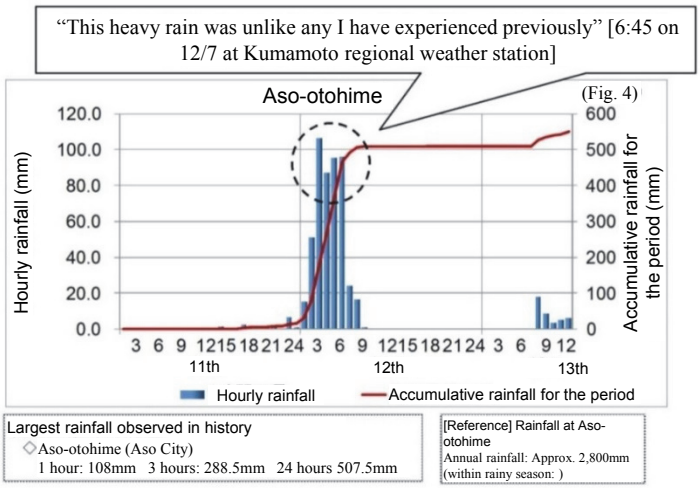
In the widespread flooding of Kumamoto on 12 July 2012, cumulonimbus clouds repeatedly formed from before daybreak and through the morning in the back-building phenomenon, leading to record rainfall that caused extremely extensive damage in various locations across the prefecture, such as landslides, rivers burst banks, 25 dead or missing, and homes, public civil engineering facilities and lifelines severely damaged.

[Situation on 12 July] (Survey in Minamiasomura, Aso)

- Due to sudden heavy rain late at night, the situation was such that surroundings could not be checked, especially around midnight
- Due to an hourly rainfall in excess of 100mm and lightning, the situation was such that the thought of going outside was stifling, to the extent of make me feel in physical danger
- Road was flooded, so evacuating on foot or by vehicle would have been difficult
- The heavy rainfall and the lightning noise made it impossible to hear people's voices

⇨ Amidst heavy rain and lightning late at night, local citizens found it difficult to take actual evacuation action, they feared accidents in trying to evacuate, so the housing cooperative was hesitant to officially announce evacuation advisory in accordance with the criteria for making such predetermined announcements.

What the public said about the situation on 12 July



Hourly rainfall and transition of accumulated rainfall at Aso-otohime AMeDAS observation station

Critical Situations

Critical situation point

Most of the shelters used were facilities outside of landslide and flood warning zones designated in advance in the disaster prevention plans of municipalities, but there were some that were not designated in advance or ended up being inside landslide and/or flood warning zones. Moreover, some shelters were in facilities that had yet to be earthquake-proofed.

▶ Result: Facilities inside landslide and/or flood warning zones were used as shelters, putting evacuees at risk.

*Sources: After action review report on response to widespread flood disaster in Kumamoto (15), p29, December 2012

Similar cases at other local government offices

- The roads near an opened shelter were flooded, which meant that some people could not evacuate to that shelter – thus, the situation should have been grasped before the shelter was opened. (25)
- Among the opened shelters, there were some that were in unsuitable locations in terms of storms and flooding – thus, in accordance with the type of disaster, shelters able to cope with the conditions should have been opened. (20)
- Most attention is given to earthquake disaster response – therefore, in cases of storms and flooding, there were not documents covering criteria for setting up shelters, guidelines on what to do if a shelter floods, or the dangers on evacuation routes. (6)

Countermeasure

Check prediction results for floods and landslides, and specify shelters (designated emergency evacuation shelters and sites, etc.).

Lessons to be learned

Procedure Specify/review shelters according to type of disaster expected

- As some facilities not designated in municipality disaster prevention plans and other facilities inside landslide and/or flood warning zones were used as shelters during previous disasters, efforts should be taken to promote advance designation of shelters and to review shelter usage in accordance with the type of disaster expected. (15)
- Furthermore, some facilities yet to be earthquake-proofed were used as shelters, so facilities should be reviewed and earthquake-proofing promoted. (15)

Procedure Take into consideration situations at times of disaster, and reflect that consideration in setting/reviewing evacuation routes

- Shelters and evacuation routes are vital to the safety of the public in a disaster situation, but that does not mean that they are in the best locations for all disasters, so review and set safe shelters and evacuation routes. (6)

Procedure Implement measures on the assumption of a nighttime disaster

- As people may have to evacuate at night, make sure they undergo thorough evacuation training, and implement safety measures for evacuation at night, such as providing lights and safe facilities. (6)

Procedure Strive to get neighborhood associations to implement evacuation training and to inspect evacuation routes

- Strive to get neighborhood associations to implement evacuation training and to inspect dangerous locations on evacuation routes in normal times. (25)

Skill Improve evacuation skills among the public by raising awareness about evacuation methods dependent on the type of disaster.

- Regarding evacuation methods for different types of disaster, make the public aware of them, and denote evacuation routes on hazard maps. (25)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guideline (1) related to evacuation advisories (evacuation behavior/information transmission edition), (Disaster Management, Cabinet Office, Japan, March 2019)
  (In particular, Chapter 3: What information provision ought to be from the perspective of people receiving an evacuation advisory, etc.)
- Guidelines on sediment disaster warning evacuation,
  Sediment control department, Ministry of Land, Infrastructure, Transport and Tourism (MLIT) Japan, April 2015
  (In particular, Chapter 4: transmission of information, etc.)
- Disaster prevention & risk management self-check items
  (Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, Japan, March 2017)
  (In particular, Chapter 2-3: Preparing for Evacuation of Residents, etc.)

Are staff members going to open all of these shelters from here on?

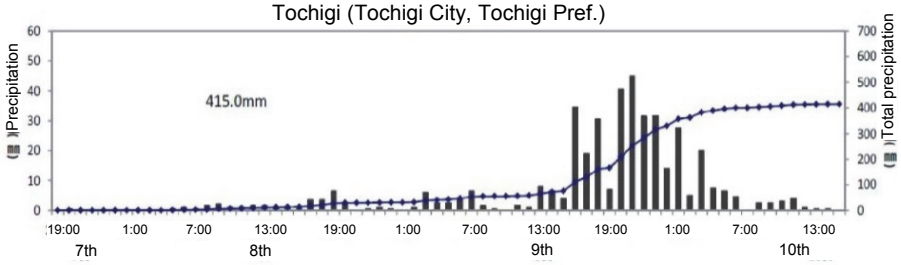
~ Delays in opening shelters due to centralized jurisdiction over unlocking ~

Case

- Local government: Tochigi, Tochigi pref.
- Disaster: September 2015 Kanto-Tohoku heavy rainfall (2015 Ibaraki flooding)
- Date: Afternoon of 9th to 11th of September 2015

Disaster Outline

From the 9th and all through the 10th of September 2015, heavy rain (daily rainfall of 299.0mm, hourly rate of 49.5mm) fell, causing Uzumagawa, Akazugawa and Naganokawa rivers to overflow and greatly damage various locations in the city. This disaster left a massive trail of destruction, including one person dead, more than 2,700 properties damaged, while landslides and overflow water cut off numerous roads and damaged rivers, and mudslides damaged agriculture by blocking wastewater channels and smothering fields.



Precipitation transition

Overflow from Uzumagawa River

Critical Situations

Critical situation point

It took time to open shelters because facility keys had to be retrieved from the local government office after hours.

Critical situation point

Roads were flooded and in a dangerous condition at the point at which shelters were to be opened.

Result: The shelter unit on its own was not able to swiftly open all the shelters laid down in the local disaster prevention plan.

*Sources: We will not forget! Support & restoration record for Kanto-Tohoku heavy rainfall disaster in September 2015 (25), p69, August 2016

Similar cases at other local government offices

- Being a holiday, managers of facilities were not on duty, so it took time to open the designated shelters in those facilities. (21)
- Only half the required number of vehicles needed when opening shelters were available, so opening the shelters took time. (20)
- Some shelters took time to open, and, in the midst of the hustle and bustle of disaster response, safety checks were not carried out on some shelters, while, in other cases, there were delays in making the opening report to the disaster control headquarters. (15)
- In cases where local units supervising shelters had to assemble to open shelters, opening up took time. (13)

Countermeasure

Let local citizens have the authority to open shelters (designated emergency evacuation shelters and sites).

Lessons to be learned

Procedure: Opening of shelters, etc., by autonomous disaster prevention organizations

- Consider letting neighborhood associations and autonomous disaster prevention organizations open shelters because letting them being involved from the time such facilities are opened is the ideal approach. (26)

Procedure: Produce a shelter management manual that assumes cooperation with local citizens

- A manual related to managing shelters is needed. And, in producing that manual, making cooperation with local citizens a prerequisite is one kind of policy for responding to a disaster that stretches the human resources (personnel) of the city. (23)

Procedure: Name in advance the personnel members to open shelters, etc.

- Name in advance the personnel members charged with the task of going from their home to designated shelters to open them up at night or holidays (weekends). Personnel members named to do this job must collaborate with managers at local citizen centers, branch offices and other facilities to grasp the layout of designated shelters and where the emergency supplies are stored. (21)

- Improvement example: In Yokkaichi, Mie prefecture, the personnel members to supervise all designated shelters are named at the beginning of the fiscal year, and they then undergo training, familiarize themselves with layouts and emergency supplies stores in the shelters as well as participate in local disaster prevention training.

Procedure: Improve the methods for providing information to the managers of facilities

- Consider providing managers of facilities with advance information on the weather status to enable them to assemble quicker. Also consider making use of a disaster information distribution system to contact them quickly. (26)

Procedure: Consider methods for sharing keys

- Apart from managers of facilities, to facilitate the opening of shelters, consider getting elementary and junior high schools (often used as shelters) to deposit spare keys with their local ward offices or installing number combination locks on the gymnasiums of those schools. (26)

- Regarding the opening of shelters, even when entrusted to autonomous disaster prevention associations, there ought to be multiple people who can carry out the opening task. (22)

Procedure: Draw up a plan that gives consideration to non-designated shelters

- Do not rely on just designated shelters to provide evacuation cover – instead, produce a manual that always assumes non-designated shelters are going to be needed as well. (23)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Shelter management guideline, Disaster Management, Cabinet Office, Japan, April 2016
- The ideal way for schools to handle disasters well (strengthening disaster prevention functions to respond to tsunamis and serve as shelters), facility policy planning division, MEXT, 7 March 2014

Apparently the road to the shelter is flooding!

~ Difficulties in evacuating due to damage of evacuation route ~

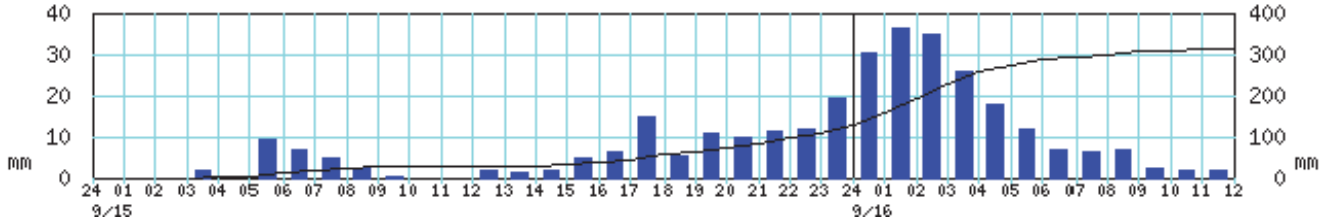
Case

- Local government: Kyoto, Kyoto pref.
- Disaster: 2013 typhoon No. 18 heavy rainfall (2013 heavy rainfall, Kyoto)
- Date: 15 to 16 September 2013

Disaster Outline

Typhoon No. 18 (15 to 16 September 2013) brought about the first ever official announcement of the “emergency heavy rain warning”, with record rainfall in all areas of Kyoto. In response, people from the volunteer fire corps, flood fighting corps, neighborhood associations, autonomous disaster prevention associations and social welfare council as well as many local residents collaborated closely with ward offices, the fire department and others in a spirit of self-help and cooperation, working fervently around the clock to provide disaster relief.

Keihoku



Precipitation over time at Keihoku AMeDAS base, Kyoto
(2013 typhoon 18 heavy rainfall [Kyoto local weather station])

Critical Situations

Critical situation point: Shelters located on low ground were at risk of flooding.

Critical situation point: The timing for officially announcing the evacuation advisories was too slow.

▶ Result: Some shelters could not be accessed dues to flooding of roads.

*Sources: Summary pertaining to response to urban damage caused by typhoon No. 18 (19), p18, December 2013

Similar cases at other local government offices

- Some people could not evacuate to shelters because they would have had to cross swollen rivers. (25)
- It was difficult to access shelters because nearby areas were flooded. (25)
- The safety of routes to shelters could not be confirmed. (9)

Countermeasure

Make people aware that they have no option but to shelter upstairs (vertical evacuation) in their own homes if going outside is dangerous.

Lessons to be learned

Procedure: Make the public aware of hazard maps

- Set evacuation routes, and get local citizens to familiarize themselves with hazard maps, etc. (25)

Procedure: Encourage autonomous disaster prevention associations to draw up their own disaster prevention measures

- Strive to get communities to create local neighborhood association hazard maps based on official hazard maps in order for residents to know the danger spots in their neighborhoods, and what routes they should use to evacuate. (9)
- Strive to get neighborhood associations to implement evacuation training from normal times, including the checking of evacuation routes and the highlighting of dangerous sections on those routes. (25)

Procedure: Get the public to familiarize themselves with vertical evacuation (upstairs evacuation in sturdy properties)

- Get the public to familiarize themselves with vertical evacuation, which involves taking refuge upstairs in homes or in tall buildings in areas where there is no risk of buildings collapsing and flood water level is predicted to be less than five meters. (25)
- Improvement example: In Tochigi, Tochigi prefecture, the public was made aware of the effectiveneass of vertical evacuation. Also, Tochigi intends to tell the public that there is no need to go to a shelter if they are in a safe place, and that they can opt to shelter in a relative's or friend's home.

Procedure: Specify local middle-to-high-rise buildings as designated emergency evacuation sites

- Promote initiatives to develop support cooperation systems between communities and businesses for times of disaster, and, based on the disaster countermeasures basic law, specify local middle-to-high-rise buildings as designated emergency evacuation sites at times of flooding. (19)

Procedure: Review procedures to enable earlier calls for evacuation

- Review procedures to enable earlier issuing of messages for opening shelters and evacuation information. (19)
- If it looks like the evacuation advisory will be announced at night due to approaching typhoon, open shelters during daylight hours and call on the public to evacuate of their own free will. (25)

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Guideline (1) related to evacuation advisories (evacuation behavior/information transmission edition), (Disaster Management, Cabinet Office, Japan, March 2019)
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- Disaster prevention & risk management self-check items
  (Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, Japan, March 2017)
  (In particular, Chapter 2-3: Preparing for Evacuation of Residents, etc.)

Does the shelter have TV or the internet?

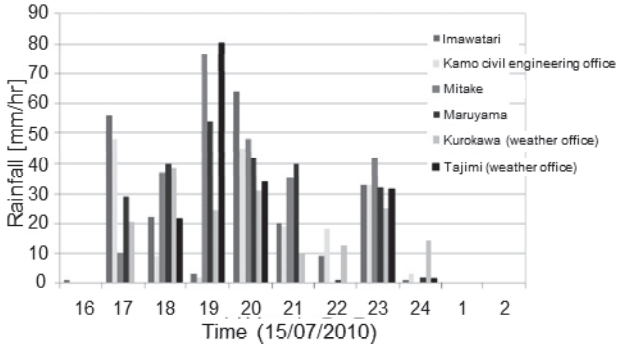
~ Lack of ways to gather information in shelters ~

Case

- Local government: Kani, Gifu pref.
- Disaster: 7.15 heavy rainfall (2010 heavy rainfall, Kani, Gifu pref.)
- Date: Afternoon of 15th to before daybreak on 16th of July 2010

Disaster Outline

Rain started to fall from around 16:00 on 15 July, turning into a thunderstorm that recorded 20mm of rain in a ten minute period on the city hall's rain gauge from 16:20. Thereafter, rain continued to fall intermittently, recording some 270mm of precipitation at the city hall over seven hours from rainfall commencement, making it a record rainfall unmatched in recent years. The style of rainfall varied greatly by area. Kanigawa River burst its banks. Roads were flooded in various areas, properties inundated with water and damage caused by landslides.



Amount of rainfall over time at gauge locations

A scene in the city

Critical Situations

Critical situation point

In a gymnasium serving as a shelter, there were no phones, no computers and no TVs.

▶ Result Absolutely no information reached the shelter.

*Sources: After action review report on damage of torrential rain on 7.15 (9), p41, 4 November 2010

Similar cases at other local government offices

- The shelter was not set up for people to view the internet, so necessary information could not be quickly passed on to evacuees. (24)
- There were no TVs or radios in the shelter, so disaster information was not available. (21)
- Orders came from disaster control headquarters to move semi-fixed wireless devices from staff rooms to the gymnasiums; however, as the method (disconnecting/connecting) was not known, some schools (shelters) were unable to carry out this task. For this reason, private mobile phones had to be used to communicate with headquarters. (20)
- There were some shelters that did not have government emergency radios and/or satellite mobile phones. (15)
- Shelters did not have information terminals, such as computers, so forms of communication with the disaster control headquarters were limited, which meant we could not provide evacuees with sufficient information. (10)

Countermeasure

Ensure that shelters (designated emergency evacuation sites) have equipment (TVs, government emergency radios, etc.) for acquiring at least the bare minimum in information.

Lessons to be learned

Facilities — Organize methods for providing information to evacuees

- Install computers and other such devices (that provide email and internet connection) to smoothly provide information to citizens. (10)
- Consider placing TVs and radios in shelters to provide evacuees with local weather information and damage status in the city concerned. (20)

Facilities — Organize shelter operating fixtures

- As many facilities do not have the fixtures that enable smooth operation as a shelter (emergency power supply, government emergency radio, satellite mobile phone, etc.), it is recommended that such necessary fixtures be organized (made available to facilities). (15)
- Items needed to run shelters, such as radios and torches, must be ready and available at all times in designated emergency evacuation sites. (21)
- Consider actions such as a thorough review of how to use semi-fixed wireless devices, increasing the number of mobile wireless devices and redeploying wireless devices kept in the local government office. (20)

Skill — Become familiar with operating methods of fixtures/equipment

- Regarding the operation and handling of government emergency radio equipment, implement workshops and training to enable people to become thoroughly familiarized with such equipment. (20)

Procedure — Make people aware of what items they need to bring when evacuating (evacuation materials)

- Use public information activities to inform citizens of what evacuation materials (radio, etc.) they need to have ready in an emergency bag. (21)

Procedure — Organize the methods for providing information to shelters

- Whenever necessary, use government emergency radio, disaster prevention email and other forms of communication to provide information about damage status, shelter opening status and weather conditions, etc., from the disaster control headquarters to designated emergency evacuation sites. (21)
- Consider making use of a disaster information distribution system, etc., in order to quickly make contact with managers of facilities (that will become shelters). (26)
- Improvement example: In Yokkaichi, Mie prefecture, designated emergency evacuation sites have been equipped with MCA wireless devices and radios to provide information.

Related guidelines

- Guide for municipality flood response (Disaster Management, Cabinet Office, Japan, July 2019)
- Shelter management guideline, Disaster Management, Cabinet Office, Japan, April 2016
- The ideal way for schools to handle disasters well (strengthening disaster prevention functions to respond to tsunamis and serve as shelters), facility policy planning division, MEXT, 7 March 2014
- Toward strengthening the functions of municipal disaster control headquarters ~Case studies on disaster prevention information system~,
(Civil Protection and Disaster Management Department, Fire and Disaster Management Agency, July 2017)

Training Worksheet for Critical Situations in Response to Flooding

●Target and example of this worksheet

No.	Example

●Five questions for chosen example

(1) Could a similar situation occur in your local authority/department?

(2) In particular, are there any conditions that could trigger the same kind of situation?

(3) Are necessary measures (facilities and equipment, etc.) in place to avoid the situation occurring?

(4) Are necessary measures (procedures, manuals and plans, etc.) in place to avoid the situation occurring?

(5) Are necessary measures (for improving skills) in place to avoid the situation occurring?

Affiliation (organization)：　　Name：

Postscript

To smoothly respond to disasters, local governments must learn from past disasters and must improve the capabilities of personnel members to enable them to predict in advance the kinds of difficulties that may occur in order to take the necessary advance measures.

In this case study booklet, as reference material for making use of examples of critical situations (scary mishaps), where an accident could easily occur in fields related to occupational hazards and accidents, I show typical examples drawn from verification data (After-action review reports, etc.) of past responses to flooding published by local governments to freshly define critical situations that occur in disaster response.

I hope that this booklet will serve to provide hints on what measures need to be implemented in advance and what needs to be considered by local governments to improve the capabilities of personnel members, and, in so doing, will serve as a link to smoothly combatting disasters when future flooding occurs.

Keeping in mind the stages that need to be worked through before wide-area support personnel arrive, please note that the disaster phase that this booklet deals with is the period from before the disaster outbreak up to the opening of shelters, it does not include life rebuilding assistance and recovery work.

Further, the cases in this booklet are based on disaster knowledge in Japan at time of publishing – hence, the contents of this booklet must be updated as needed.

I would like to take this opportunity to thank all of the following for their help. Concerning extracts in this booklet, I referred to Yotaro Hatamura's book "Learning from Failure" (Kodansha Bunko, 2005). I also received cooperation in the tasks of compiling and editing this booklet from Daisuke Kuribayashi (former Senior Researcher) and Naoko Nagumo (Research Specialist) of the Public Works Research Institute (PWRI) as well as the Research Center for Sustainable Communities in the Tokyo headquarters of CTI Engineering Co., Ltd., and Yachiyo Engineering Co., Ltd. Furthermore, I received invaluable advice from Hiroji Kuroda (Chief Researcher) of the Institute of Scientific Approaches for Fire & Disaster.

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June 2020

Critical Situations during Flood Emergency Response
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